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GE Healthcare

Technical Publications

Direction **DOC0245727**
Revision **2**

Centricity Radiology RA600 8.0
Centricity Cardiology CA1000 2.0
Centricity Digital Hardcopy 2.0

CONFORMANCE STATEMENT for DICOM V3.0

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TABLE OF CONTENTS

1. Introduction 7

1.1 Scope and Field of Application 7

1.2 Overview 7

1.3 Overall DICOM Conformance Statement Document Structure 8

1.4 Intended Audience 9

1.5 Scope and Field of Application 9

1.6 Important Remarks 10

1.7 References 11

1.8 Definitions 11

1.9 Symbols and Abbreviations 11

1.10 Revision History 11

1.11 Important Considerations for the Reader 12

1.12 Acknowledgment of Trade Names 12

2 IMPLEMENTATION MODEL 13

2.1 Application Data Flow Diagram 13

2.2 Functional Definitions of Application Entities 14

2.3 Sequencing of Real World Activities 14

3 APPLICATION ENTITY SPECIFICATIONS 15

3.1 DICOM Services AE Specifications 15

3.1.1 Association Establishment Policies 18

3.1.1.1 General 18
3.1.1.2 Number of Associations 18
3.1.1.3 Synchronous Nature 18
3.1.1.4 Implementation Identifying Information 18

3.1.2 Association Initiation Policy 19

3.1.2.1 Send Images to a Remote System 20
3.1.2.2 Query a Remote Database 22
3.1.2.3 Retrieve from a Remote System 25
3.1.2.4 Print to a Remote DICOM Printer 27
3.1.2.5 Retrieve a Modality Worklist from a Remote System 32
3.1.2.6 Send Modality Performed Procedure Step Messages to a Remote System 34
3.1.2.7 Verify the Committed Storage of Images on a Remote System 37
3.1.2.8 Convey a Study Status Change to a Remote System 38
3.1.2.9 Request a Study Status Change from a Remote System 38

3.1.3 Association Acceptance Policy 39

3.1.3.1 Verify Communication with a Remote System 39

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3.1.3.2 Receive Images from a Remote System 40
3.1.3.3 Query the Centricity RA600/CA1000/DHC Database 44
3.1.3.4 Retrieve from the Centricity RA600/CA1000/DHC Database 48
3.1.3.5 Commit Storage of Images in the Centricity RA600/CA1000/DHC Database 49
3.1.3.6 Receive a Study Status Change Request from a Remote System 51
3.1.3.7 Receive a Study Status Change Event from a Remote System 52

3.2 Centricity RA600/CA1000/DHC DICOM Media Server AE 53
3.2.1 Implementation Model 53
3.2.1.1 Application Data Flow Diagram 53
3.2.1.2 File Meta Information Options 53
3.2.2 AE Specifications 54
3.2.2.1 Centricity RA600/CA1000/DHC Application Entity Specification 54
3.2.2.2 Real-World Activities 55
3.2.3 Character Sets 62

4 COMMUNICATION PROFILE 63

4.1 Supported Communication Stacks 63

4.2 OSI Stack 63

4.3 TCP/IP Stack 63
4.3.1 Physical Media Support 63

4.4 Point-to-Point Stack 63

5 EXTENSIONS / SPECIALIZATIONS / PRIVATIZATIONS 64

5.1 Standard Extended / Specialized / Private SOPs 64
5.1.1 GSPS objects referring to colour images 64
5.1.2 Collage IOD 64

5.2 Private Transfer Syntaxes 64

5.3 Private Tags 65
5.3.1 Private tags created and used in GSPS objects 65
5.3.2 Private tags, read from IODs 65
5.3.3 Private tags supported by the Query SCP (Study Level) 66

6 CONFIGURATION 67

6.1 AE Title/Presentation Address Mapping 67

6.2 Configurable Parameters 67

7 SUPPORT OF EXTENDED CHARACTER SETS 68

Annex A: GE Healthcare Private Uncompressed Application Profile 69

A.1 CLASS AND PROFILE IDENTIFICATION 69

A.2 CLINICAL CONTEXT 69
A.2.1 ROLES AND SERVICE CLASS OPTIONS SECTION 69

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A.3 GENERAL CLASS PROFILE 70
A.3.1 SOP CLASSES AND TRANSFER SYNTAXES 70
A.3.2 PHYSICAL MEDIA AND MEDIA FORMATS 71
A.3.3 DIRECTORY INFORMATION IN DICOMDIR 71

Annex B: GE Healthcare Private Compressed Application Profile 72

B.1 CLASS AND PROFILE IDENTIFICATION 72

B.2 CLINICAL CONTEXT 72
B.2.1 ROLES AND SERVICE CLASS OPTIONS SECTION 72

B.3 GENERAL CLASS PROFILE 73
B.3.1 SOP CLASSES AND TRANSFER SYNTAXES 73
B.3.2 PHYSICAL MEDIA AND MEDIA FORMATS 74
B.3.3 DIRECTORY INFORMATION IN DICOMDIR 74

Annex C: GE Healthcare Private Cardiac Exchange Profile 75

C.1 CLASS AND PROFILE IDENTIFICATION 75

C.2 CLINICAL CONTEXT 75
C.2.1 ROLES AND SERVICE CLASS OPTIONS SECTION 75

C.3 GENERAL CLASS PROFILE 75
C.3.1 SOP CLASSES AND TRANSFER SYNTAXES 75
C.3.2 PHYSICAL MEDIA AND MEDIA FORMATS 77
C.3.3 DIRECTORY INFORMATION IN DICOMDIR 77
C.4 SPECIFIC APPLICATION PROFILES 77
C.4.1 PRI-GEMS-CVIS-EXCHANGE 77

Annex D: GE Healthcare Private Cardiac Archive Profile 78

D.1 CLASS AND PROFILE IDENTIFICATION 78

D.2 CLINICAL CONTEXT 78
D.2.1 ROLES AND SERVICE CLASS OPTIONS SECTION 78

D.3 GENERAL CLASS PROFILE 78
D.3.1 SOP CLASSES AND TRANSFER SYNTAXES 78
D.3.2 PHYSICAL MEDIA AND MEDIA FORMATS 80
D.3.3 DIRECTORY INFORMATION IN DICOMDIR 80
D.4 SPECIFIC APPLICATION PROFILES 80
D.4.1 PRI-GEMS-CVIS-ARCHIVE 80

Annex E: GE Healthcare Private PET-CT Profile 82

E.1 CLASS AND PROFILE IDENTIFICATION 82

E.2 CLINICAL CONTEXT 82
E.2.1 ROLES AND SERVICE CLASS OPTIONS SECTION 82

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E.3 GENERAL CLASS PROFILE.....82
E.3.1 SOP CLASSES AND TRANSFER SYNTAXES 82
E.3.2 PHYSICAL MEDIA AND MEDIA FORMATS 83
E.3.3 DIRECTORY INFORMATION IN DICOMDIR.....83

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1. Introduction

1.1 Scope and Field of Application

This document is the DICOM Conformance Statement for three products based upon the RA600 platform:

- Version 8.0 of Centricity Radiology RA600 (Radiology Workstation)
- Version 2.0 of Centricity Cardiology CA1000 (Cardiology / Enterprise Workstation)
- Version 2.0 of Centricity Digital Hardcopy (DICOM Appliance)

Although sold as different products, these products behave 100% identical from a DICOM perspective.
In this document these products are referred as Centricity RA600/CA1000/DHC.The purpose of this document is to describe how these products collaborate in a DICOM network with other medical imaging applications that conform to the DICOM 3.0 standard.

1.2 Overview

This DICOM Conformance Statement is divided into Sections as described below:

- **Section 1 (Introduction)** describes the overall structure, intent, and references for this Conformance Statement
- **Section 2 (Implementation Model)** describes the data flow for DICOM associations
- **Section 3 (Application Entity Specifications)** describes the DICOM network services and association policies for initiation and acceptance. Furthermore the DICOM Media Server properties are described.
- **Section 4 (Communication Profile)** describes the communication stack behavior.
- **Section 5 (Extensions / Specializations / Privatizations)** describes the private features of Centricity RA600/CA1000/DHC that are publicly available.
- **Section 6 (Configuration)** describes the configurable parameters for Centricity RA600/CA1000/DHC that have influence on the DICOM behavior.
- **Section 7 (Extended Charact Sets)** describes the character sets supported by Centricity RA600/CA1000/DHC.

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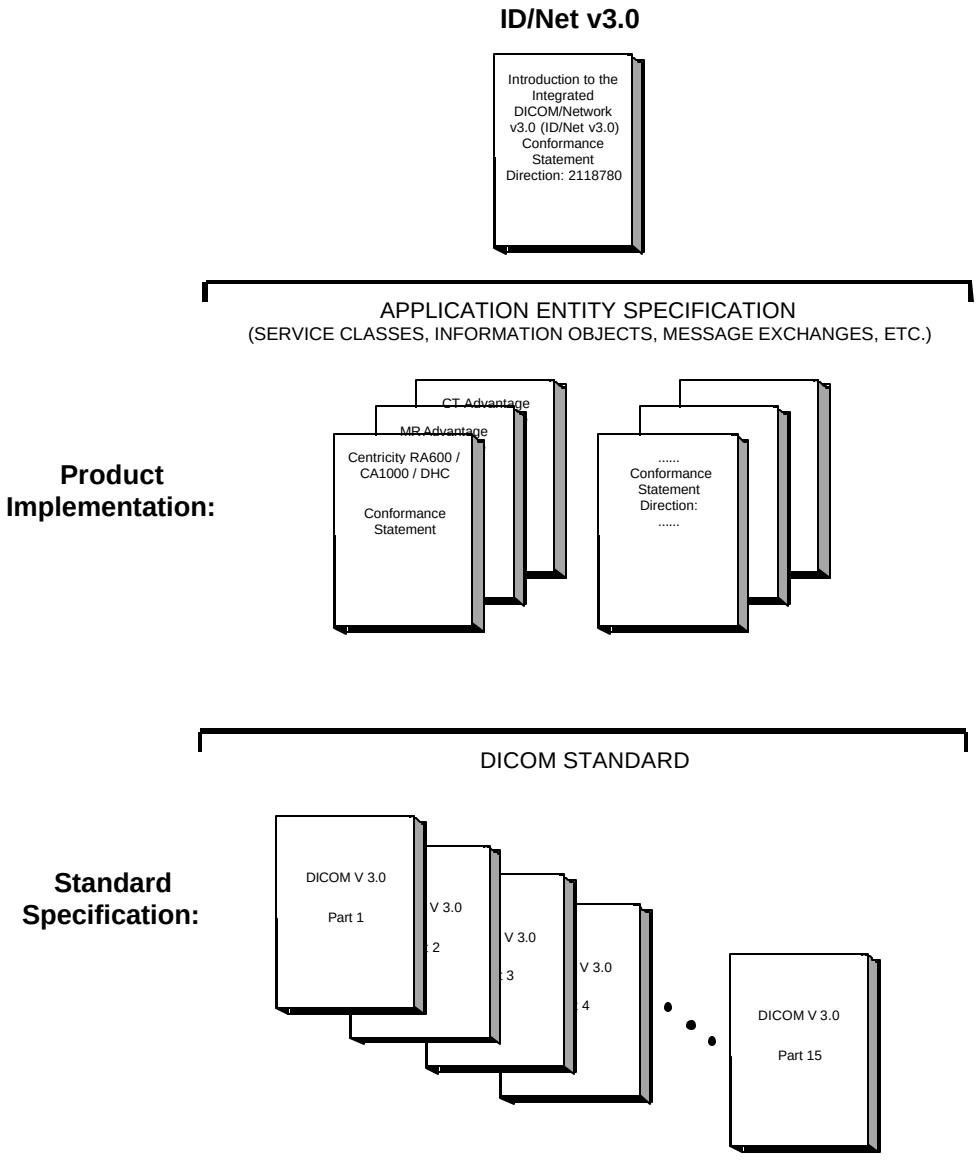
1.3 Overall DICOM Conformance Statement Document Structure

The Documentation Structure of the GE Healthcare Conformance Statements and their relationship with the DICOM v3.0 Conformance Statements is shown in the Illustration below.



This document specifies the DICOM v3.0 implementation. It is named:

Centricity RA600 V8.0 / CA1000 V2.0 / Digital Hardcopy V2.0
Conformance Statement for DICOM v3.0
Direction DOC0245727

This DICOM Conformance Statement documents the DICOM v3.0 Conformance Statement and Technical Specification required to interoperate with the GE Healthcare network interface.

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Introductory information, which is applicable to all GE Healthcare Conformance Statements, is described in the document:

Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0)
Conformance Statement
Direction: 2118780.

This Introduction familiarizes the reader with DICOM terminology and general concepts. It should be read prior to reading the individual products' GE Healthcare Conformance Statements.
The GE Healthcare Conformance Statement, contained in this document, also specifies the Lower Layer communications, which it supports (e.g., TCP/IP). However, the Technical Specifications are defined in the DICOM v3.0 Part 8 standard.
For more information including Network Architecture and basic DICOM concepts, please refer to the Introduction.

For more information regarding DICOM, copies of the Standard may be obtained on the Internet at http://medical.nema.org. Comments on the Standard may be addressed to:

DICOM Secretariat
NEMA
1300 N. 17th Street, Suite 1847
Rosslyn, VA 22209
USA
Phone: +1.703.841.3200

1.4 Intended Audience

The reader of this document is concerned with software design and/or system integration issues. It is assumed that the reader of this document is familiar with the DICOM v3.0 Standards and with the terminology and concepts that are used in those Standards.
If readers are unfamiliar with DICOM v3.0 terminology they should first refer to the document listed below, then read the DICOM v3.0 Standard itself, prior to reading this DICOM Conformance Statement document.

Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0)
Conformance Statement
Direction: 2118780

1.5 Scope and Field of Application

It is the intent of this document, in conjunction with the *Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780*, to provide an unambiguous specification for GE Healthcare implementations. This specification, called a Conformance Statement, includes a DICOM v3.0 Conformance Statement and is necessary to ensure proper processing and interpretation of GE Healthcare medical data exchanged using DICOM v3.0. The GE Healthcare Conformance Statements are available to the public.
The reader of this DICOM Conformance Statement should be aware that different GE Healthcare devices are capable of using different Information Object Definitions. For example, a GE Healthcare CT Scanner may send images using the CT Information Object, Basic Structured Report Information Object, Secondary Capture Object, etc.
Included in this DICOM Conformance Statement are the Module Definitions, which define all data elements, used by this GE Healthcare implementation. If the user encounters unspecified private data elements while parsing a GE Healthcare Data Set, the user is well advised to ignore those

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data elements (per the DICOM v3.0 standard). Unspecified private data element information is subject to change without notice. If, however, the device is acting as a "full fidelity storage device", it should retain and re-transmit all of the private data elements that are sent by GE Healthcare devices.

1.6 Important Remarks

The use of these DICOM Conformance Statements, in conjunction with the DICOM v3.0 Standards, is intended to facilitate communication with GE imaging equipment. However, **by itself, it is not sufficient to ensure that inter-operation will be successful**. The **user (or user's agent)** needs to proceed with caution and address at least four issues:

- **Integration** – The integration of any device into an overall system of interconnected devices goes beyond the scope of standards (DICOM v3.0), and of this introduction and associated DICOM Conformance Statements when interoperability with non-GE equipment is desired. The responsibility to analyze the applications requirements and to design a solution that integrates GE imaging equipment with non–GE systems is the **user's** responsibility and should not be underestimated. The **user** is strongly advised to ensure that such an integration analysis is correctly performed.
- **Validation** – Testing the complete range of possible interactions between any GE device and non–GE devices, before the connection is declared operational, should not be overlooked. Therefore, the **user** should ensure that any non–GE provider accepts full responsibility for all validation required for their connection with GE devices. This includes the accuracy of the image data once it has crossed the interface between the GE imaging equipment and the non–GE device and the stability of the image data for the intended applications.

  Such a validation is required before any clinical use (diagnosis and/or treatment) is performed. It applies when images acquired on GE imaging equipment are processed/displayed on a non-GE device, as well as when images acquired on non-GE equipment is processed/displayed on a GE console or workstation.
- **Future Evolution –** GE understands that the DICOM Standard will evolve to meet the user's growing requirements. GE is actively involved in the development of the DICOM v3.0 Standard. DICOM v3.0 will incorporate new features and technologies and GE may follow the evolution of the Standard. The GE Healthcare protocol is based on DICOM v3.0 as specified in each DICOM Conformance Statement. Evolution of the Standard may require changes to devices that have implemented DICOM v3.0. **In addition, GE reserves the right to discontinue or make changes to the support of communications features (on its products) reflected on by these DICOM Conformance Statements.** The user should ensure that any non–GE provider, which connects with GE devices, also plans for the future evolution of the DICOM Standard. Failure to do so will likely result in the loss of function and/or connectivity as the DICOM Standard changes and GE Products are enhanced to support these changes.
- To be informed of the evolution of the implementation described in this document, the User is advised to regularly check the internet site via www.ge.com/dicom
- **Interaction** - It is the sole responsibility of the **non–GE provider** to ensure that communication with the interfaced equipment does not cause degradation of GE imaging equipment performance and/or function.

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1.7 References

A list of references, which is applicable to all GE Healthcare Conformance Statements, is included in the *Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780*.

1.8 Definitions

A set of definitions, which is applicable to all GE Healthcare Conformance Statements, is included in *the Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780*.

1.9 Symbols and Abbreviations

A list of symbols and abbreviations, which is applicable to all GE Healthcare Conformance Statements, is included in the *Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780*.

1.10 Revision History

Version	**Date**	Description
Preliminary	September 1995	Preliminary version
1.0	October 1995	First official version
2.0	November 1996	Second official version
2.1	June 1997	Updated for RadWorks 2.1 release
2.1a	August 1997	Final (minor) update for RadWorks 2.1 release
4.0	November 1998	Updated for RadWorks 4.0 release
5.0	5 August 1999	Updated for RadWorks 5.0 release
5.1	September 2000	Updated for RadWorks 5.1 release
6.0	13 May 2002	Update for Centricity RA600 6.0 M4 Release
6.1	January 2003	Update for Centricity RA600 6.1 M4 Release
6.1.1	1 May 2003	Update for Centricity RA600 6.1 SR2
7.0, rev. 1	6 July 2004	Added to eLibrary. Using eLibrary revision numbers. Update for RA600 V7.0 / CA1000 V1.0 / DHC V1.0 release
7.0, rev. 2	8 February 2005	Updated implementation version ID and UID, minor issues.
8.0	October 2006	Revision for RA600 V8.0 / CA1000 V2.0 / DHC V2.0 release
8.0 rev. 2	6 September 2007	Revision to add the (8800.0200) Thumbnail tag to the SOP class Query

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1.11 Important Considerations for the Reader

This DICOM Conformance Statement by itself is not sufficient to guarantee successful connectivity between Centricity RA600/CA1000/DHC and equipment from other vendors. The following considerations should be made:

- The integration of equipment from different vendors (including GE Healthcare) goes beyond the scope of the DICOM 3.0 standard and the DICOM Conformance Statements from GE Healthcare and other vendors. It is the responsibility of the user (or user's agent) to assess the application requirements and to design a solution that integrates GE Healthcare equipment with equipment from other vendors.
- When the comparison of this DICOM Conformance Statement with a DICOM Conformance Statement from another vendor indicates that connectivity should be possible it is the responsibility of the user (or user's agent) to verify this by carrying out validation tests and to check whether all required functionality is met.
- With regard to the future evolution of the DICOM 3.0 standard GE Healthcare reserves the right to make changes to the Centricity RA600/CA1000/DHC architecture described in this document. The user (or user's agent) should ensure that any equipment connected via DICOM to GE Healthcare equipment also follows the future evolution of the DICOM 3.0 standard. Failure to do so may result in (partial) loss of connectivity.

1.12 Acknowledgment of Trade Names

All trade names mentioned in this document are recognized.
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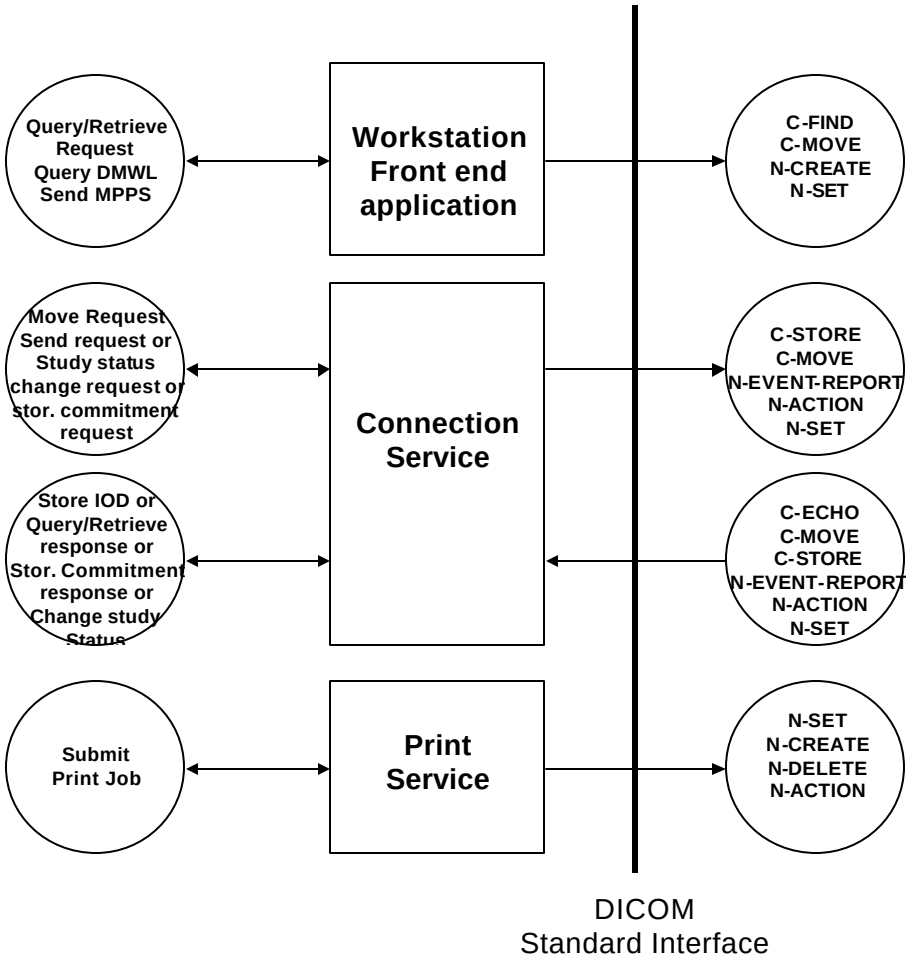
2 IMPLEMENTATION MODEL

The Centricity RA600/CA1000/DHC DICOM services are implemented as three separate processes that share a single Application Entity Title. Currently all three processes can all initiate associations with remote application entities while one can accept associations from remote Application Entities as well. In addition the Centricity RA600/CA1000/DHC front-end application can initiate (but not accept[1]) DICOM associations with remote application entities.

2.1 Application Data Flow Diagram

The Implementation Model for the Centricity RA600/CA1000/DHC DICOM services is depicted below:



The Centricity RA600/CA1000/DHC DICOM services 'Connection Service' and 'Print Service' are implemented as separate Windows services that run as background processes. They are started

[1] SCP behavior is implemented in the Connection Service and not by the front-end application. The Connection Service is the single point of entry for incoming DICOM connectivity and it's always alive when the system is turned on. The Centricity RA600/CA1000/DHC front-end application can be shut down without influencing incoming DICOM connectivity.

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automatically during system start-up and will remain active until shutdown. This means that requests for, e.g., image storage can be accepted at all times when the system is up and running regardless of whether the Centricity RA600/CA1000/DHC front-end application is active or not.

The Centricity RA600/CA1000/DHC Connection Service is responsible for image reception and transmission in addition to accepting requests for database queries and retrieves. It maintains logs of all studies that entered and left the system. It can perform scheduled image transfers to remote Application Entities at all times.

The Centricity RA600/CA1000/DHC front-end application issues queries to remote DICOM databases. The Centricity RA600/CA1000/DHC Connection Service initiates retrieve requests. Please note that the destination of retrieve operations is the Centricity RA600/CA1000/DHC Connection Service.

The Centricity RA600/CA1000/DHC Print Service is responsible for managing print job queues for one or more printers or DICOM Printers. It supports several protocols of which the DIC OM standard is one.

In addition to the Storage SOP Class support for networking, the Centricity RA600/CA1000/DHC front-end application supports the Media Storage Service Class for the Interchange of images as a File Set Reader (FSR) and File Set Creator (FSC). For Centricity Digital Hardcopy the Database Service supports the Media Storage Service Class for the Interchange of images as a File Set Creator (FSC).
FSR is a standard feature and FSC is an optional feature. See section 3.2 for further details.

2.2 Functional Definitions of Application Entities

The Application Entity of the Centricity RA600/CA1000/DHC Connection Service acts as an SCU for the storage and storage commitment SOP classes and as an SCP for verification, storage, query, retrieve, and storage commitment SOP classes. In specific situations Centricity RA600/CA1000/DHC Connection Service may act as an SCU for DICOM Modality Worklists

The Application Entity of the Centricity RA600/CA1000/DHC front-end application acts as an SCU for the query and retrieve SOP classes. In specific situations the Centricity RA600/CA1000/DHC front-end application may act as an SCU for DICOM Modality Worklists SOP class, and as an SCU for the Modality Performed Procedure Step SOP class.

The Application Entity of the Centricity RA600/CA1000/DHC Print Service acts as an SCU for the basic grayscale and color print management meta SOP classes, and optionally the Print Job and Basic Annotation Box SOP classes.

2.3 Sequencing of Real World Activities

Not applicable.

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3 APPLICATION ENTITY SPECIFICATIONS

3.1 DICOM Services AE Specifications

The Centricity RA600/CA1000/DHC DICOM services provide support for the following DICOM V3.0 SOP Classes, both as an SCU and an SCP:

SOP Classes as SCU and SCP	
SOP Class Name	**SOP Class UID**
Verification	1.2.840.10008.1.1
Storage Commitment Push Model	1.2.840.10008.1.20.1
Detached Study Management	1.2.840.10008.3.1.2.3.1
Patient Root Query/Retrieve Model – FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Model – FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2
Patient/Study Only Query/Retrieve Model – FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient/Study Only Query/Retrieve Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2
CR Image	1.2.840.10008.5.1.4.1.1.1
DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1
DX Image (Process)	1.2.840.10008.5.1.4.1.1.1.1.1
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2
DX Mammography Image (Process)	1.2.840.10008.5.1.4.1.1.1.2.1
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3
DX Intra-oral Image (Process)	1.2.840.10008.5.1.4.1.1.1.3.1
CT Image	1.2.840.10008.5.1.4.1.1.2
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1
MR Image	1.2.840.10008.5.1.4.1.1.4
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6
US Image	1.2.840.10008.5.1.4.1.1.6.1
SC Image	1.2.840.10008.5.1.4.1.1.7
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3
Multi-Frame True Color SC Image	1.2.840.10008.5.1.4.1.1.7.4
Standalone Overlay	1.2.840.10008.5.1.4.1.1.8
Standalone Curve	1.2.840.10008.5.1.4.1.1.9
12-lead ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2
Hemodynamic Waveform	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Audio Waveform	1.2.840.10008.5.1.4.1.1.9.4.1
Standalone Modality LUT	1.2.840.10008.5.1.4.1.1.10
Standalone VOI LUT	1.2.840.10008.5.1.4.1.1.11
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1
XA Image	1.2.840.10008.5.1.4.1.1.12.1
XF Image	1.2.840.10008.5.1.4.1.1.12.2
NM Image	1.2.840.10008.5.1.4.1.1.20
Raw Data	1.2.840.10008.5.1.4.1.1.66
VL Image (Retired)	1.2.840.10008.5.1.4.1.1.77.1
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3

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SOP Classes as SCU and SCP	
SOP Class Name	**SOP Class UID**
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4
Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11
Enhanced Structured Reports	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive Structured Reports	1.2.840.10008.5.1.4.1.1.88.33
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67
PET Image	1.2.840.10008.5.1.4.1.1.128
Standalone PET Curve	1.2.840.10008.5.1.4.1.1.129
RT Image	1.2.840.10008.5.1.4.1.1.481.1
RT Dose	1.2.840.10008.5.1.4.1.1.481.2
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4
RT Plan	1.2.840.10008.5.1.4.1.1.481.5
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7
GE Collage	1.2.528.1.1001.5.1.1.1
GE AW 3D	1.2.840.113619.4.26
GE eNTEGRA	1.2.840.113619.4.27
GE AW Raw Data	1.2.840.113619.4.30

SOP Classes as SCU Only	
SOP Class Name	**SOP Class UID**
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9
Print Job	1.2.840.10008.5.1.1.14
Basic Annotation Box	1.2.840.10008.5.1.1.15
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31

Though Centricity RA600/CA1000/DHC is able to receive many SOP classes, not all SOP classes can be completely visualized. The following features concern visualization of IODs:

- The DICOM information of all storage IODs can be displayed in raw or formatted form, including private data
- Image type Storage IODs can be displayed with their image data, when their Photometric interpretation is one of the types “MONOCHROME1”, “MONOCHROME2”, “RGB”, “PALETTE COLOR”, “YBR_FULL” and “YBR_FULL_422”.
- Grayscale Softcopy Presentation State IODs can be applied to studies or displayed with their referenced images completely, except for the following sub-features:
    - Masks
    - Bitmap Display Shutters
    - Overlay Planes
    - Overlay/Curve Activation
- Instances of the following IODs cannot be visualized:
    - Standalone Overlay
    - Standalone Curve
    - 12-lead ECG Waveform

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- General ECG Waveform
- Ambulatory ECG Waveform
- Hemodynamic Waveform
- Cardiac Electrophysiology Waveform
- Basic Voice Audio Waveform
- Standalone Modality LUT
- Standalone VOI LUT
- Standalone PET Curve
- RT Dose
- RT Structure Set
- RT Beams Treatment Record
- RT Plan
- RT Brachy Treatment Record
- RT Treatment Summary Record
- GE AW 3D
- GE eNTEGRA
- GE AW Raw Data

- Basic Structured Reports IODs can be displayed, including resolving Image UID references. Enhanced and Comprehensive Structured Reports will be displayed likewise, but their enhanced features like SCOORD Value Types or embedded thumbnail images will not be resolved graphically. Their complete contents will be displayed though in a character type way.
- Key Object Note IODs can be either displayed with their images or applied to the images currently displayed. In both cases Centricity RA600/CA1000/DHC only supports references to images of the same study the key image note object IOD is part of. 'Foreign' references are just ignored.
- Overlay information stored in Image type IODs can be displayed in an on/off mode, i.e. there is no option to display overlay planes individually. Both embedded overlays (stored in the pixeldata element 7FE0, 0010) and non-embedded (stored in element 60xx, 3000) are supported.
- Embedded ECG information In the elements of group 5000 on Multi-frame XA images is displayed in specific circumstances:
  - (0008, 0060) Modality must be XA
  - (5000, 0005) Curve dimensions must be equal to 2
  - (5000, 0020) Type of data must be equal to "ECG"
  - (5000, 0030) Axis units must be "DPPS/NONE"
  - (5000, 0103) Data representation must be equal to 0
  - (5000, 0110) Curve data descriptor missing or not equal to 0/1

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3.1.1 Association Establishment Policies

3.1.1.1 General

The configuration of the Centricity RA600/CA1000/DHC DICOM services in the Windows Registry shall define such parameters as Application Entity title, host name, and port number that are shared by the Connection, Database and Print Services. They offer a (configurable) maximum PDU size of 4 MB (4194304 bytes) upon association initiation and on associations initiated by remote applications.

3.1.1.2 Number of Associations

The Centricity RA600/CA1000/DHC Connection Service supports multiple associations both as an SCU[2] and SCP. The maximum number of simultaneous associations that the Connection Service will support as an SCP is configurable and it defaults to 4.

The Centricity RA600/CA1000/DHC front-end application supports multiple associations as an SCU for query and retrieve to different SCPs.

The Centricity RA600/CA1000/DHC Print Service SCU will queue its DICOM print jobs in a way that it only establishes one association at a time.

3.1.1.3 Synchronous Nature

The Centricity RA600/CA1000/DHC DICOM services do not support asynchronous operations and will not perform asynchronous window negotiation.

3.1.1.4 Implementation Identifying Information

The Implementation Class UID is: 1.2.528.1.1001.2.20060808.1
The version name is: GEHC_DCM06_1

[2] When the Connection Service is actively sending data, it will effectively use one single association at a time. Multiple simultaneous associations as an SCU may occur when the Connection Service is processing a C-Move request as an SCP.

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3.1.2 Association Initiation Policy

The Centricity RA600/CA1000/DHC Connection Service initiates associations for the following activities:

- The Centricity RA600/CA1000/DHC user wants to send images or other IODs from the local Centricity RA600/CA1000/DHC database to a remote system.
- The Centricity RA600/CA1000/DHC user wants to request storage commitment after images from the local Centricity RA600/CA1000/DHC database have been transmitted to a remote system.
- The Centricity RA600/CA1000/DHC user wants to convey a study status change to a remote system
- The Centricity RA600/CA1000/DHC user wants a remote system to change the study status for a certain study.

The Centricity RA600/CA1000/DHC front-end application initiates associations for the following activities:

- The Centricity RA600/CA1000/DHC user wants to query the contents of a remote database on a Patient, Study, Series or Instance level.
- The Centricity RA600/CA1000/DHC user wants to retrieve studies, series, images or other IODs from a remote database into the local Centricity RA600/CA1000/DHC database.
- The Centricity RA600/CA1000/DHC user wants to retrieve a Modality Worklist from an external Modality Worklist Provider
- The Centricity RA600/CA1000/DHC user wants to send a Modality Performed Procedure Step success message to indicate that a DICOM Modality Worklist item was handled and resulted in a study, ready for reading by the radiologist (using the optional Quality Control module).
- The Centricity RA600/CA1000/DHC user wants to send a Modality Performed Procedure Step failure message to indicate that a DICOM Modality Worklist item will not be handled (using the optional Quality Control module).

The Centricity RA600/CA1000/DHC Print Service initiates associations for the following activities:

- The Centricity RA600/CA1000/DHC user wants to print images to a DICOM Printer.

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3.1.2.1 Send Images to a Remote System

3.1.2.1.1 Associated Real World Activity

The user of the Centricity RA600/CA1000/DHC system makes a selection of one or more studies and series in the local Database and subsequently presses the Send button which will initiate the transfer of images from the local database of Centricity RA600/CA1000/DHC to the remote system.

3.1.2.1.2 Proposed Presentation Contexts

Presentation Context Table for Send To Remote System				
Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
Name	UID			
CR Image	1.2.840.10008.5.1.4.1.1.1	See UID list A below	SCU	None
DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1	See UID list A below	SCU	None
DX Image (Process)	1.2.840.10008.5.1.4.1.1.1.1.1	See UID list A below	SCU	None
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2	See UID list A below	SCU	None
DX Mammography Image (Process)	1.2.840.10008.5.1.4.1.1.1.2.1	See UID list A below	SCU	None
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3	See UID list A below	SCU	None
DX Intra-oral Image (Process)	1.2.840.10008.5.1.4.1.1.1.3.1	See UID list A below	SCU	None
CT Image	1.2.840.10008.5.1.4.1.1.2	See UID list A below	SCU	None
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3	See UID list A below	SCU	None
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	See UID list A below	SCU	None
MR Image	1.2.840.10008.5.1.4.1.1.4	See UID list A below	SCU	None
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5	See UID list A below	SCU	None
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6	See UID list A below	SCU	None
US Image	1.2.840.10008.5.1.4.1.1.6.1	See UID list A below	SCU	None
SC Image	1.2.840.10008.5.1.4.1.1.7	See UID list A below	SCU	None
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1	See UID list A below	SCU	None
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2	See UID list A below	SCU	None
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3	See UID list A below	SCU	None
Multi-Frame True Color SC Image	1.2.840.10008.5.1.4.1.1.7.4	See UID list A below	SCU	None
Standalone Overlay	1.2.840.10008.5.1.4.1.1.8	See UID list B below	SCU	None
Standalone Curve	1.2.840.10008.5.1.4.1.1.9	See UID list B below	SCU	None
12-lead ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.1	See UID list B below	SCU	None
General ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2	See UID list B below	SCU	None
Ambulatory ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2	See UID list B below	SCU	None
Hemodynamic Waveform	1.2.840.10008.5.1.4.1.1.9.2.1	See UID list B below	SCU	None
Cardiac Electrophysiology Waveform	1.2.840.10008.5.1.4.1.1.9.3.1	See UID list B below	SCU	None
Basic Voice Audio Waveform	1.2.840.10008.5.1.4.1.1.9.4.1	See UID list B below	SCU	None
Standalone Modality LUT	1.2.840.10008.5.1.4.1.1.10	See UID list B below	SCU	None
Standalone VOI LUT	1.2.840.10008.5.1.4.1.1.11	See UID list B below	SCU	None
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1	See UID list B below	SCU	None
XA Image	1.2.840.10008.5.1.4.1.1.12.1	See UID list A below	SCU	None
XF Image	1.2.840.10008.5.1.4.1.1.12.2	See UID list A below	SCU	None
NM Image	1.2.840.10008.5.1.4.1.1.20	See UID list A below	SCU	None
Raw Data	1.2.840.10008.5.1.4.1.1.66	See UID list B below	SCU	None
VL Image (Retired)	1.2.840.10008.5.1.4.1.1.77.1	See UID list A below	SCU	None
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2	See UID list A below	SCU	None
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1	See UID list A below	SCU	None
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2	See UID list A below	SCU	None
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3	See UID list A below	SCU	None
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4	See UID list A below	SCU	None
Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11	See UID list B below	SCU	None
Enhanced Structured Reports	1.2.840.10008.5.1.4.1.1.88.22	See UID list B below	SCU	None
Comprehensive Structured Reports	1.2.840.10008.5.1.4.1.1.88.33	See UID list B below	SCU	None
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40	See UID list B below	SCU	None

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Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	See UID list B below	SCU	None
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	See UID list B below	SCU	None
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	See UID list B below	SCU	None
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	See UID list B below	SCU	None
Encapsulated PDF	1.2.840.10008.5.1.4.1.1.104.1	See UID list B below	SCU	None
PET Image	1.2.840.10008.5.1.4.1.1.128	See UID list A below	SCU	None
Standalone PET Curve	1.2.840.10008.5.1.4.1.1.129	See UID list B below	SCU	None
RT Image	1.2.840.10008.5.1.4.1.1.481.1	See UID list A below	SCU	None
RT Dose	1.2.840.10008.5.1.4.1.1.481.2	See UID list B below	SCU	None
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	See UID list B below	SCU	None
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4	See UID list B below	SCU	None
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	See UID list B below	SCU	None
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6	See UID list B below	SCU	None
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7	See UID list B below	SCU	None
GE Collage	1.2.528.1.1001.5.1.1.1	See UID list B below	SCU	None
GE AW 3D	1.2.840.113619.4.26	See UID list B below	SCU	None
GE eNTEGRA	1.2.840.113619.4.27	See UID list B below	SCU	None
GE AW Raw Data	1.2.840.113619.4.30	See UID list B below	SCU	None

UID List A:

Transfer Syntaxes for Send To Remote System	
Name	**UID**
Implicit VR, Little Endian	1.2.840.10008.1.2
Explicit VR, Little Endian	1.2.840.10008.1.2.1
Explicit VR, Big Endian	1.2.840.10008.1.2.2
Explicit VR, Lossy JPEG 8-Bit Image Compression	1.2.840.10008.1.2.4.50
Explicit VR, Lossy JPEG 12-Bit Image Compression	1.2.840.10008.1.2.4.51
Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
JPEG 2000 (Lossless Only) Transfer JPEG 2000 Transfer	1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91
Explicit VR, RLE Lossless compression	1.2.840.10008.1.2.5
Explicit VR, AMI Wavelet Progressive Lossy Compression	1.2.528.1.1001.4.1.1.2
Explicit VR, AMI JPEG Lossy Compression 8-bit	1.2.528.1.1001.4.2.1.1
Explicit VR, AMI JPEG Lossy Compression 12-bit	1.2.528.1.1001.4.2.1.2
Explicit VR, AMI ZLIB Lossless Compression	1.2.528.1.1001.4.4.1

UID List B:

Transfer Syntaxes for Send To Remote System	
Name	**UID**
Implicit VR, Little Endian	1.2.840.10008.1.2
Explicit VR, Little Endian	1.2.840.10008.1.2.1
Explicit VR, Big Endian	1.2.840.10008.1.2.2

3.1.2.1.3 SOP Specific Conformance Statement for SOP Class Storage

The images stored in the local Centricity RA600/CA1000/DHC database that are to be sent are converted from the local Centricity RA600/CA1000/DHC DICOM 3.0 compliant format to instances of the corresponding SOP Storage class(es) and subsequently sent to the remote system.

Centricity RA600/CA1000/DHC allows image transfers to be scheduled for specific times and has mechanisms for retrying a transfer in case that a transfer failed at an earlier time. After a

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configurable number of unsuccessful attempts Centricity RA600/CA1000/DHC will mark the transfer as failed. The Centricity RA600/CA1000/DHC system keeps a log of transfers that is viewable by the user. The log indicates the status of transfers.

Centricity RA600/CA1000/DHC provides full (level 2) conformance as SCP of the Storage SOP class. This means that upon sending an image received via DICOM on to another DICOM compliant system it will send out all attributes that it received (this includes private attributes from other vendors).

When the user selects a lossy transfer syntax to be used for sending a certain study to another system the study will be compressed before transmission if it was not already compressed. The attributes “Derivative Description” (0008,2111) and “Lossy Compression” (0008, 2112) will be set to specify that lossy compression has been applied to the pixel data and this string has to be shown to the user when the images are subsequently viewed (as is done by Centricity RA600/CA1000/DHC). In the case the receiving workstation is from a 3rd party vendor it is their responsibility to display this string correctly.

If the study in the Centricity RA600/CA1000/DHC database was stored in a specific compression format (because it was received previously with compression, or compressed before storage), this compressed transfer syntax will be requested in addition to and in preference of the explicit and implicit little endian transfer syntaxes. If the C-STORE SCP chooses not to use this ‘native’ compressed transfer syntax, the image data will be decompressed before it will be sent to the C-STORE SCP.

Centricity RA600/CA1000/DHC is able to send data formerly received or stored in lossy compressed format in any uncompressed or lossless compressed format, or in the original lossy format. Centricity RA600/CA1000/DHC will not decompress lossy compressed pixel data and subsequently re-compress it in a (different) lossy compression format.
When storing decompressed image data that was formerly stored in JPEG lossy format, the “Derivation Description” tag (0008,2111) and “Lossy Compression” tag (0008, 2112) will still specify that lossy JPEG compression had previously been applied to the pixel data and should still be shown to the user when the images are viewed. For more information see ‘3.1.3.2 Receive Images from a Remote System’.

3.1.2.2 Query a Remote Database

3.1.2.2.1 Associated Real World Activity

The user of the Centricity RA600/CA1000/DHC system wants to have a view on a remote DICOM database and either views the complete contents of the remote database or fills out a query dialog box with fields for Patient Name, Patient ID, Study date, etc. Wildcards can be used instead of fully specified information to allow flexible queries. The contents of this dialog box and the requested columns in the Remote view can be fully configured, hence the contents of the Query data is dependent on the configuration.

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3.1.2.2.2 Proposed Presentation Contexts

Presentation Context Table for Remote Database Query					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Patient Root Query/ Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		
Study Root Query/ Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		
Patient/Study Only Query/ Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

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3.1.2.2.3 SOP Specific Conformance Statement for SOP Class Query

The following keys are by default[3] supported for the Patient Root Query:

Level	Description	Tag
Patient	Specific Character Set	(0008,0005)
Patient	Patient's Name	(0010,0010)
Patient	Patient ID	(0010,0020)
Patient	Patient's Birth Date	(0010,0030)
Patient	Patient's Sex	(0010,0040)
Patient	Other Patient IDs	(0010,1000)
Study	Specific Character Set	(0008,0005)
Study	Study Description	(0008,1030)
Study	Study Date	(0008,0020)
Study	Study Instance UID	(0020,000D)
Study	Study ID	(0020,0010)
Study	Performing Physician's Name	(0008,1050)
Study	Accession Number	(0008,0050)
Study	Number of Study Related Series	(0020,1206)
Study	Number of Study Related Instances/Images	(0020,1208)
Series	Series Instance UID	(0020,000E)
Series	Series number	(0020,0011)
Series	Modality	(0008,0060)
Series	Number of Series Related Instances/Images	(0020,1209)
Instance	Instance Number	(0020,0013)
Instance	Rows	(0028,0010)
Instance	Columns	(0028,0011)
Instance	Thumbnail	(0088,0200)

The Patient/Study levels in the table above are also supported for the Patient/Study Only Query. For a Study Root Query by default[3] the following keys are supported:

Level	Description	Tag
Study	Specific Character Set	(0008,0005)
Study	Patient's Name	(0010,0010)
Study	Patient ID	(0010,0020)
Study	Patient's Birth Date	(0010,0030)
Study	Patient's Sex	(0010,0040)
Study	Study Description	(0008,1030)
Study	Study Date	(0008,0020)
Study	Study Instance UID	(0020,000D)
Study	Study ID	(0020,0010)
Study	Performing Physician's Name	(0008,1050)
Study	Accession Number	(0008,0050)
Study	Number of Study Related Series	(0020,1206)
Study	Number of Study Related Instances/Images	(0020,1208)
Series	Series Instance UID	(0020,000E)
Series	Series number	(0020,0011)
Series	Modality	(0008,0060)

[3] The user is able to add any valid DICOM tag to this query.

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Series	Number of Series Related Instances/Images	(0020,1209)
Instance	Instance Number	(0020,0013)
Instance	Rows	(0028,0010)
Instance	Columns	(0028,0011)
Instance	Thumbnail	(0088,0200)

Centricity RA600/CA1000/DHC expects the remote Query SCP to perform all of the following matching methods:

Matching methods for Study/Patient Root Query
Method[4]
Single Value Matching
Wild Card Matching
Range Matching
Universal Matching

3.1.2.3 Retrieve from a Remote System

3.1.2.3.1 Associated Real World Activity

After a view on a remote DICOM database has been obtained the user makes a selection of one or more studies, series or images and subsequently presses the Import button. This will initiate the transfer of images from the remote system to the local database of Centricity RA600/CA1000/DHC.

The Centricity RA600/CA1000/DHC Connection Service (or optionally the front-end application) performs the C-MOVE operation. The destination of the resulting C-STORE operation is the Centricity RA600/CA1000/DHC Connection Service in all cases.

3.1.2.3.2 Proposed Presentation Contexts

Presentation Context Table for Remote System Retrieve					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name**	**UID**		**Negotiation**
Patient Root Query/ Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		
Study Root Query/ Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		
Patient/Study Only Query/ Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

[4] Centricity RA600/CA1000/DHC's query SCU will only send restrictive queries on the top level, i.e. either Patient or Study level. Queries on deeper levels (series/Image) will be a combination of Single value match for one field with universal Match for all other fields (e.g. query for all series belonging to a certain study)

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3.1.2.3.3 SOP Specific Conformance Statement for SOP Class Retrieve

The Centricity RA600/CA1000/DHC front-end application provides standard conformance.

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3.1.2.4 Print to a Remote DICOM Printer

3.1.2.4.1 Associated Real World Activity

The Centricity RA600/CA1000/DHC user selects a study in the local database and submits it to the Print Service as a job for the desired DICOM Printer. The user can choose several parameters such as the layout of the film and number of copies.

Or:

The Centricity RA600/CA1000/DHC user creates a Virtual Film Sheet print job from the studies available in the Viewing module and submits it as a job for the desired DICOM Printer. On a per-image or per-sheet basis several parameters can be altered. When submitting the job the user can choose a few parameters, such as the number of copies.

3.1.2.4.2 Proposed Presentation Contexts

Proposed Presentation Contexts for Print Server Management Activity					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	Implicit VR, Little Endian	1.2.840.10008.1.2	SCU	None
Print Job[5]	1.2.840.10008.5.1.1.14	Implicit VR, Little Endian	1.2.840.10008.1.2	SCU	None
Basic Annotation Box[6]	1.2.840.10008.5.1.1.15	Implicit VR, Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18	Implicit VR, Little Endian	1.2.840.10008.1.2	SCU	None
Presentation LUT[7]	1.2.840.10008.5.1.1.23	Implicit VR, Little Endian	1.2.840.10008.1.2	SCU	None

3.1.2.4.3 SOP Specific Conformance Statement for Meta SOP Classes Basic Grayscale and Color Print Management

The Centricity RA600/CA1000/DHC Print Service supports the following mandatory SOP classes as defined by the Basic Grayscale Print Management Meta SOP class:

Supported SOP classes as Basic Grayscale Print Management Meta SOP class	
SOP Class Name	SOP Class UID
Basic Film Session Basic Film Box	1.2.840.10008.5.1.1.1 1.2.840.10008.5.1.1.2
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4
Printer	1.2.840.10008.5.1.1.16

[5] The Print Job SOP class is negotiated only if the Print Destination is configured for it
[6] The Basic Annotation Box SOP class is negotiated only if the Print Destination is configured for it
[7] The Presentation LUT SOP Class is negotiated only if the Print Destination is configured for it

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The Centricity RA600/CA1000/DHC Print Service supports the following mandatory SOP classes as defined by the Basic Color Print Management Meta SOP class:

Supported SOP classes for Basic Color Print Management Meta SOP class	
SOP Class Name	**SOP Class UID**
Basic Film Session	1.2.840.10008.5.1.1.1
Basic Film Box	1.2.840.10008.5.1.1.2
Basic Color Image Box	1.2.840.10008.5.1.1.4.1
Printer	1.2.840.10008.5.1.1.16

The Centricity RA600/CA1000/DHC Print Service supports the following optional SOP classes both for the Basic Grayscale Print Management Meta SOP class and the Basic Color Print Management Meta SOP class, individually configurable for individual printers:

Supported Optional SOP classes	
SOP Class Name	**SOP Class UID**
Print Job	1.2.840.10008.5.1.1.14
Basic Annotation Box	1.2.840.10008.5.1.1.15
Presentation LUT	1.2.840.10008.5.1.1.23

The Centricity RA600/CA1000/DHC Print Service is able to send the appropriate data to printers that support True Size printing, both for grayscale printers and color printers. The Centricity RA600/CA1000/DHC Print Service will send the pixel data in its native size and additionally sends the Requested Image Size (2020,0030), which is considered to be a request to the Print SCP to Print at that size.

Please note that there is no formal way in DICOM to verify whether a DICOM Print SCP actually supports True Size printing, and that some Print SCPs do not report a failure when the Requested Image Size (tag 2020,0030) was requested by the SCU but not supported by the SCP.
As a result Centricity RA600/CA1000/DHC Print Service can be configured in a way that it seems that images will be printed True Size, while they are just printed at a different size. It is up to the system integrator to verify from the printer's DICOM Conformance Statement whether that printer supports True Size printing, before setting the True Size option in the configuration for that particular printer.

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3.1.2.4.4 Conformance for SOP Class Basic Film Session

The Centricity RA600/CA1000/DHC Print Service includes the following attributes in the N-CREATE for the Basic Film Session SOP class:

Attributes for Basic Film Session SOP class N-CREATE		
Description	**Tag**	**Range of values**
Number of Copies	(2000,0010)	1-10000 (Max. user value configurable, default 5)
Print Priority	(2000,0020)	"LOW", "MED", "HIGH" (according to print priority in Centricity RA600/CA1000/DHC)
Medium Type	(2000,0030)	<configurable>
Film Destination	(2000,0040)	"MAGAZINE", "PROCESSOR", <more configurable>
Film Session Label	(2000,0050)	<configurable>

The N-SET and N-ACTION are currently unused. The N-DELETE is used to delete the complete Basic Film Session SOP instance hierarchy.

3.1.2.4.5 Conformance for SOP Class Basic Film Box

The Centricity RA600/CA1000/DHC Print Service includes the following attributes in the N-CREATE for the Basic Film Box SOP class:

Attributes for Basic Film Box SOP class N-CREATE			
Description	**Tag**	**Usage**	**Range of values**
Annotation Display Format (BAB)	(2010,0010)	A[8]	<configurable>[9]
Film Orientation	(2010,0040)	A	"PORTRAIT", "LANDSCAPE"
Film Size ID	(2010,0050)	A	<configurable>
Magnification Type	(2010,0060)	C[10]	"BILINEAR", "CUBIC", "NONE", <more configurable>
Max Density	(2010,0130)	C	<configurable>
Configuration Information	(2010,0150)	C	<configurable>
Smoothing Type	(2010,0080)	C	<configurable>
Border Density	(2010,0100)	C	<configurable>
Empty Image Density	(2010,0110)	C	<configurable>
Min Density	(2010,0120)	C	<configurable>
Trim	(2010,0140)	C	"YES", "NO", ""

The N-SET is currently unused. The N-ACTION is used to print a complete Basic Film Box SOP instance and N-DELETE is used to delete it after printing.

[8] A means the attribute is always sent
[9] This value determines the number of Basic Image Box positions
[10] C means the attribute is only sent when not empty

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3.1.2.4.6 Conformance for SOP Class Basic Grayscale Image Box

The Centricity RA600/CA1000/DHC Print Service includes the following attributes in the N-SET for the Basic Grayscale Image SOP class:

Attributes for Basic Grayscale Image SOP Box class N-SET			
Description	**Tag**	**Usage**	**Range of values**
Image Position	(2020,0010)	A	1…[11]
Preformatted Grayscale Image Sequence	(2020,0110)	A	
> Samples Per Pixel	(0028,0002)	A	1
> Photometric Interpretation	(0028,0004)	A	"MONOCHROME2"
> Rows	(0028,0010)	A	
> Columns	(0028,0011)	A	
> Pixel Aspect Ratio	(0028,0034)	A	
> Bits Allocated[12]	(0028,0100)	A	8, 16
> Bits Stored[1]	(0028,0101)	A	8, 12
> High Bit[1]	(0028,0102)	A	7, 11
> Pixel Representation	(0028,0103)	A	0
> Pixel Data	(7FE0,0010)	A	
Requested Image Size	(2020,0030)	C[13]	hor. size of the image in mm.

3.1.2.4.7 Conformance for SOP Class Basic Color Image Box

The Centricity RA600/CA1000/DHC Print Service includes the following attributes in the N-SET for the Basic Color Image Box SOP class:

Attributes for Basic Color Image Box SOP class N-SET			
Description	**Tag**	**Usage**	**Range of values**
Image Position	(2020,0010)	A	1…
Preformatted Color Image Sequence	(2020,0111)	A	
> Samples Per Pixel	(0028,0002)	A	3
> Photometric Interpretation	(0028,0004)	A	
> Planar Configuration	(0028,0006)	A	RGB
> Rows	(0028,0010)	A	
> Columns	(0028,0011)	A	
> Pixel Aspect Ratio	(0028,0034)	A	
> Bits Allocated	(0028,0100)	A	8
> Bits Stored	(0028,0101)	A	8
> High Bit	(0028,0102)	A	7
> Pixel Representation	(0028,0103)	A	0
> Pixel Data	(7FE0,0010)	A	
Requested Image Size	(2020,0030)	C[13]	hor. size of the image in mm.

[11] Depends on the chosen Image Display format
[12] The Centricity RA600/CA1000/DHC Print Service offers support for either 8 or 12-bit printing. For 12-bit printing Bits Allocated is set to 16, Bits Stored is set to 12, and High Bit is set to 11. For 8-bit printing the values are 8, 8, and 7 respectively.
[13] Only sent when the 'true size' option is used, See additional note in section 3.1.2.4.3 on page 27

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3.1.2.4.8 Conformance for SOP Class Printer

The Centricity RA600/CA1000/DHC Print Service shall accept N-EVENT-REPORT and return confirmation accordingly.

Both the Centricity RA600/CA1000/DHC front-end application (option DICOM Printer Status) and the Centricity RA600/CA1000/DHC Print Service use N-GET commands for the Printer SOP class to get information from the SCP.

3.1.2.4.9 SOP Specific Conformance for SOP Class Print Job

Centricity RA600/CA1000/DHC can optionally request this SOP Class from the SCP. In case it is supported the Centricity RA600/CA1000/DHC Print Service will track the progress of the current job via N-EVENT-REPORTs and will not send the next job before completion of the current job.

3.1.2.4.10 SOP Specific Conformance for SOP Class Basic Annotation Box

If the Print Destination is configured to use Basic Annotation Box, the Print Service will negotiate the SOP class when setting up the association. In case it is supported the Centricity RA600/CA1000/DHC Print Service will send a Basic Annotation Box N-SET command after it creates the Basic Film Box, using the UID returned from the Basic Film Box N-CREATE.

Attributes for Basic Annotation Box SOP class N-SET			
Description	**Tag**	**Usage**	**Range of values**
Annotation Position	(2030,0010)	A	<configurable>
Text String	(2030,0020)	A	<configurable>

3.1.2.4.11 Conformance for SOP Class Presentation LUT

If the Print Destination is configured to use a Presentation LUT the Centricity RA600/CA1000/DHC Print Service includes the following attribute in the N-CREATE for the Presentation LUT SOP class:

Attributes for Presentation LUT SOP class N-CREATE		
Description	**Tag**	**Range of values**
Presentation LUT shape	(2050,0020)	"IDENTITY"

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3.1.2.5 Retrieve a Modality Worklist from a Remote System

3.1.2.5.1 Associated Real World Activity

Centricity RA600/CA1000/DHC can query for a Modality Worklist to aid in merging patient demographics into DICOM images. This prevents the need to enter patient demographics manually and consequently eliminates a source of typing errors.

3.1.2.5.2 Proposed Presentation Contexts

Presentation Context Table for Modality Worklist Management					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.2.5.3 SOP Specific Conformance Statement for SOP Class Modality Worklist Management

Centricity RA600/CA1000/DHC provides standard conformance.

The following keys are supported for the Modality Worklist Management:

Supported keys for Modality Worklist Management			
Module	Description	Tag	Type
Scheduled Procedure Step	Scheduled Procedure Step Sequence	(0040,0100)	R
	>Scheduled Station AE Title	(0040,0001)	R
	>Scheduled Procedure Step Start Date	(0040,0002)	R
	>Scheduled Procedure Step Start Time	(0040,0003)	R
	>Modality	(0008,0060)	R
	>Scheduled Performing Physician	(0040,0006)	R
	>Scheduled Procedure Step Description	(0040,0007)	O
	>Scheduled Station Name	(0040,0010)	O
	>Scheduled Procedure Step Location	(0040,0011)	O
	>Pre-Medication	(0040,0012)	O
	>Scheduled Procedure Step ID	(0040,0009)	O
	>Requested Contrast Agent	(0032,1070)	O
Requested Procedure	Requested Procedure ID	(0040,1001)	O
	Requested Procedure Description	(0032,1060)	O
	Study Instance UID	(0020,000D)	O
	Requested Procedure Priority	(0040,1003)	O
	Patient Transport Arrangements	(0040,1004)	O
Imaging Service Request	Accession Number	(0008,0050)	O
	Requesting Physician	(0032,1032)	O
	Referring Physician's Name	(0008,0090)	O
	Study Status ID	(0032,000A)	O
	Study Priority ID	(0032,000C)	O
Visit Identification	Admission ID	(0038,0010)	O
Visit Status	Current Patient Location	(0038,0300)	O
Patient Identification	Patient's Name	(0010,0010)	R
	Patient ID	(0010,0020)	R

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Supported keys for Modality Worklist Management			
Module	**Description**	**Tag**	**Type**
	Issuer of Patient ID	(0010,0021)	O
	Other Patient IDs	(0010,1000)	O
	Other Patient Names	(0010,1001)	O
	Patient's Birth Name	(0010,1005)	O
	Patient's Mother's Birth Name	(0010,1060)	O
	Medical Record Locator	(0010,1090)	O
Patient Demographic	Patient's Birth Date	(0010,0030)	O
	Patient's Birth Time	(0010,0032)	O
	Patient's Sex	(0010,0040)	O
	Patient's Size	(0010,1020)	O
	Patient's Weight	(0010,1030)	O
	Patient's Address	(0010,1040)	O
	Military Rank	(0010,1080)	O
	Branch of Service	(0010,1081)	O
	Country of Residence	(0010,2150)	O
	Region of Residence	(0010,2152)	O
	Patient's Telephone Numbers	(0010,2154)	O
	Ethnic Group	(0010,2160)	O
	Patient's Religious Preference	(0010,21F0)	O
	Patient Comments	(0010,4000)	O
Patient Medical	Medical Alerts	(0010,2000)	O
	Contrast Allergies	(0010,2110)	O
	Pregnancy Status	(0010,21C0)	O
	Special Needs	(0038,0050)	O
	Patient State	(0038,0500)	O

Centricity RA600/CA1000/DHC expects the remote Query SCP to perform all of the following Matching methods

Matching methods for Study/Patient Root Query
Method
Single Value Matching
Universal Matching
Wild Card Matching
Range Matching

Centricity RA600/CA1000/DHC may fill no, one, or multiple attributes in the query request with a non-empty value. Centricity RA600/CA1000/DHC may thus request matching on Optional Matching Key Attributes.

All fields listed above are always included in the query request to ask the SCP to return them for each response. Centricity RA600/CA1000/DHC expects the SCP to return values for all 'R' attributes whereas the attributes marked with 'O' may be optionally filled. Therefore Centricity RA600/CA1000/DHC treats these attributes as Type 3 Return Key Attributes.

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3.1.2.6 Send Modality Performed Procedure Step Messages to a Remote System

3.1.2.6.1 Associated Real World Activity

Centricity RA600/CA1000/DHC can send Modality Performed Procedure Step messages (N-CREATE, N-SET) to remote systems, in order to indicate the completion or the discontinuation of a worklist operation.

Centricity RA600/CA1000/DHC Modality Performed Procedure Step (MPPS) functionality is embedded in the following locations:

- The Connection Service. If configured properly, an MPPS N-CREATE command and an MPPS N-SET ("In Progress") command will be sent upon requesting storage and storage commitment for a study containing SR objects suited for predefined workflow scenarios. Furthermore an MPPS N-SET ("Completed" or "Discontinued") command will be sent upon receiving storage commitment (succeeded or failed). This MPPS feature assumes the unscheduled workflow: all information in the MPPS message is extracted from the study and its SR objects.
- The optional Quality Control Module. If configured properly, the MPPS N-CREATE command and the MPPS N-SET command are sent to the configurable AE, one immediately after the other. MPPS Completion messages can be sent after the user performed a manual match between a study in the local database and an item in the Worklist. The content of both MPPS transactions is collected from the selected item in the DICOM Modality Worklist and the study involved. MPPS Discontinue messages can be sent after selecting one single item in the worklist control on the Quality Control Module's desktop (right mouse button menu). When sending a "discontinued" message, the content of both MPPS transactions is collected from the selected item in the DICOM Modality Worklist.

3.1.2.6.2 Proposed Presentation Contexts

Presentation Context Table for Modality Worklist Management					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.2.6.3 SOP Specific Conformance Statement for SOP Class Modality Performed Procedure Step

Centricity RA600/CA1000/DHC provides standard conformance.
The following keys are supported for the Modality Performed Procedure Step N-CREATE :

Supported keys for Modality Performed Procedure Step N-CREATE			
Module	**Description**	**Tag**	**Type**
Performed Procedure Step Relationship	Patient's Name	(0010,0010)	R[14]
	Patient ID	(0010,0020)	R[14]
	Patient's Birth Date	(0010,0030)	R[14]
	Patient's Sex	(0010,0040)	R[14]
	Referenced Patient Sequence	(0008,1120)	R[15]

[14] The information is copied from the study data involved

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	>Referenced SOP Class UID	(0008,1150)	-
	>Referenced SOP Instance UID	(0008,1155)	-
	Scheduled Step Attribute Sequence	(0040,0270)	R
	>Study Instance UID	(0020,000D)	R[16]
	>Referenced Study Sequence	(0008,1110)	R[15]
	>>Referenced SOP Class UID	(0008,1150)	-
	>>Referenced SOP Instance UID	(0008,1155)	-
	>Accession Number	(0008,0050)	R[14]
	>Placer Order Number/Imaging Service Request	(0040,2006)	O[17]
	>Filler Order Number/Imaging Service Request	(0040,2007)	O[17]
	>Placer Order Number/Imaging Service Request	(0040,2016)	O[17]
	>Filler Order Number/Imaging Service Request	(0040,2017)	O[17]
	>Requested Procedure ID	(0040,1001)	R[17]
	>Requested Procedure Description	(0032,1060)	R[17]
	>Scheduled Procedure Step ID	(0040,0009)	R[17]
	>Scheduled Procedure Step Description	(0040,0007)	R[17]
	>Scheduled Action Item Code Sequence	(0040,0008)	R[17]
	>>Code Value	(0008,0100)	O[17]
	>>Coding Scheme designator	(0008,0102)	O[17]
	>>Code Meaning	(0008,0104)	O[17]
Performed Procedure Step Information	Performed Station AE Title	(0040,0241)	R
	Performed Station Name	(0040,0242)	R
	Performed Location	(0040,0243)	R[15]
	Performed Procedure Step Start Date	(0040,0244)	O[14]
	Performed Procedure Step Start Time	(0040,0245)	O[14]
	Performed Procedure Step ID	(0040,0253)	R[18]
	Performed Procedure Step Status	(0040,0252)	R
	Performed Procedure Step Description	(0040,0254)	R[15]
	Comments on the Performed Procedure Step	(0040,0280)	-
	Performed Procedure Type Description	(0040,0255)	R[15]
	Procedure Code Sequence	(0008,1032)	R[17]
	>Code Value	(0008,0100)	R
	>Coding Scheme Designator	(0008,0102)	R
	>Code Meaning	(0008,0104)	R
	Modality	(0008,0060)	R[19]
	Study ID	(0020,0010)	R[14]
	Performed Procedure Step End Date	(0040,0250)	R[20]
	Performed Procedure Step End Time	(0040,0251)	R[20]
Performed Procedure Step Acquisition Results	Performed Action Item Sequence	(0040,0260)	R[21]
	>Code Value	(0008,0100)	-
	>Coding Scheme Designator	(0008,0102)	-
	>Code Meaning	(0008,0104)	-
	Performed Series Sequence	(0040,0340)	R[14]

[15] Always sent empty
[16] The Study Instance UID (0020,000D) is copied from the resulting study in case of a completion message, and it is copied from the DICOM Modality Worklist in case of a Quality Control “Discontinued” operation.
[17] In case of the Quality Control use, this information is copied from the DICOM Modality Worklist entry involved. In case of the Storage Commitment use, this item is retrieved from the SRs involved.
[18] The Performed Procedure Step ID is generated by Centricity RA600/CA1000/DHC, according to a configurable format.
[19] The field Modality (0008,0060) is copied from the resulting study in case of a completion message. In case of a Quality Control “Discontinued” operation, it is copied from the selected item in the DICOM Modality Worklist.
[20] Inserted empty in N-CREATE, System date/time in N-SET
[21] Always inserted as an empty field

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	>Performing Physician's Name	(0008,1050)	R[14]
	>Operator's Name	(0008,1070)	R[14]
	>Protocol Name	(0018,1030)	R[14]
	>Series Instance UID	(0020,000E)	R[14]
	>Series Description	(0008,103E)	R[14]
	>Retrieve AE Title	(0008,0054)	R[22]
	>Referenced Image Sequence	(0008,1140)	R[14]
	>>Referenced SOP Class UID	(0008,1150)	R[14]
	>>Referenced SOP Instance UID	(0008,1155)	R[14]
	>Referenced Standalone SOP Instance Sequence	(0040,0220)	O[23]
	>>Referenced SOP Class UID	(0008,1150)	-
	>>Referenced SOP Instance UID	(0008,1155)	-
	Anatomic Structure, Space or Region Sequence	(0008,2229)	-
	>Code Value	(0008,0100)	-
	>Coding Scheme Designator	(0008,0102)	-
	>Code Meaning	(0008,0104)	-
Performed Procedure Step Radiation Dose	Total Time of Fluoroscopy	(0040,0300)	O[17]
	Total Number of Exposures	(0040,0301)	O[17]
	Distance Source to Detector SID	(0018,1110)	O[17]
	Distance Source to Entrance	(0040,0306)	O[17]
	Entrance Dose	(0040,0302)	O[17]
	Exposed Area	(0040,0303)	O[17]
	Image Area Dose Product	(0018,115E)	O[17]
	Comments on Radiation Dose	(0040,0310)	O[17]
Performed Procedure Step Billing and Material Management	All Attributes		-

Supported keys for Modality Performed Procedure Step N-SET			
Module	**Description**	**Tag**	**Type**
Performed Procedure Step Information	Performed Procedure Step End Date	(0040,0250)	R
	Performed Procedure Step End Time	(0040,0251)	R
	Performed Procedure Step Status	(0040,0252)	R

[22] The retrieve AE Title is set to:

- the AE title of this Centricity RA600/CA1000/DHC installation in case of a Quality Control “Completed” operation.
- The AE title of the receiving system in case of a storage commit “Completed” operation
- <Empty> in case of a “Discontinued” operation

[23] In case of storage commit operation, this sequence lists the SR’s involved.

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3.1.2.7 Verify the Committed Storage of Images on a Remote System

3.1.2.7.1 Associated Real World Activity

When Centricity RA600/CA1000/DHC completes a transmission of images it can optionally verify whether the images have not only been received but also been stored successfully (committed) at the other end.

3.1.2.7.2 Proposed Presentation Contexts

Presentation Context Table for Storage Commitment Push Model					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.2.7.3 SOP Specific Conformance Statement for SOP Class Storage Commitment Push Model

Centricity RA600/CA1000/DHC provides standard conformance.
After the images and the storage commitment request have been sent, Centricity RA600/CA1000/DHC will immediately close the association and will not wait for a reply from the SCP. Instead the SCP must open a new association to Centricity RA600/CA1000/DHC in order to transmit the response. Thus the N-EVENT-REPORT must occur on a different association than the N-ACTION operation.

3.1.2.7.3.1 Operations

Centricity RA600/CA1000/DHC can request storage commitment for all SOP classes as listed in the table in section 3.1.2.2.2. Centricity RA600/CA1000/DHC supports the Referenced Study Component Sequence Attribute by including the Study Instance UID (0020,000D) of the requested objects. When storage commitment is requested for multiple studies, multiple requests are made, each on a separate association.

The validity of the Transaction UID that is generated for the storage commitment request is based on the system configuration. By default an answer must be obtained from the SCP within a configurable number of hours (default: 6 hours). After this the Transaction UID is no longer valid.

Centricity RA600/CA1000/DHC does not support the optional Storage Media File-Set ID & UID attributes.

3.1.2.7.3.2 Notifications

When Centricity RA600/CA1000/DHC receives a success status the status of the job that requested the storage commitment is changed from “Sent, waiting for storage commitment” to “Sent, storage commitment succeeded” and the job is finished. When deletion of the previously transmitted images is requested as part of the job they will be deleted.

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When Centricity RA600/CA1000/DHC receives a failure status the status of the job that requested the storage commitment is changed from “Sent, waiting for storage commitment” to “Error”. The job remains in the send queue in an error state and the specific reason for the error can be seen in the Details dialog. When deletion of the previously transmitted images is requested as part of the job this will not be done.

3.1.2.8 Convey a Study Status Change to a Remote System

3.1.2.8.1 Associated Real World Activity

The Centricity RA600/CA1000/DHC Connection Service sends out a notification (N-EVENT-REPORT) to remote DICOM system, indicating that the study status of that system has changed.

3.1.2.8.2 Accepted Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Detached Study Management	1.2.840.10008.3.1.2.3.1	Implicit VR, Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR, Little Endian	1.2.840.10008.1.2.1		

3.1.2.8.3 SOP Specific Conformance Statement for SOP Class Detached Study Management

The Centricity RA600/CA1000/DHC Connection Service provides standard conformance.

3.1.2.9 Request a Study Status Change from a Remote System

3.1.2.9.1 Associated Real World Activity

The Centricity RA600/CA1000/DHC Connection Service sends out a request to a remote DICOM system, requesting the change of the study status for a certain study, residing on the remote system.
It will use a DICOM N-SET command for this.

3.1.2.9.2 Accepted Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Detached Study Management	1.2.840.10008.3.1.2.3.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

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3.1.2.9.3 SOP Specific Conformance Statement for SOP Class Detached Study Management

The Centricity RA600/CA1000/DHC Connection Service provides standard conformance.

3.1.3 Association Acceptance Policy

The Centricity RA600/CA1000/DHC Connection Service accepts associations for the following activities:

- Verification of the DICOM communication between a remote system and Centricity RA600/CA1000/DHC.
- Transfer of images from a remote system to Centricity RA600/CA1000/DHC.
- Processing of a query from a remote system.
- Initiation of a transfer of images to a remote system when a retrieve request is received.
- Commit the storage of images on a Centricity RA600/CA1000/DHC system.
- Receive a Study Status Change Request from a remote system
- Receive a Study Status Change Event from a remote system

Centricity RA600/CA1000/DHC Connection Service can be configured in a way that it will reject association requests from unknown applications. Centricity RA600/CA1000/DHC connection service will always reject associations who use the wrong value for the called AE Title

3.1.3.1 Verify Communication with a Remote System

3.1.3.1.1 Associated Real World Activity

The Centricity RA600/CA1000/DHC Connection Service will respond to verification request made by remote systems.

3.1.3.1.2 Accepted Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.3.1.3 SOP Specific Conformance Statement for SOP Class Verification

The Centricity RA600/CA1000/DHC Connection Service provides standard conformance.

3.1.3.1.4 Presentation Context Acceptance Criterion

There are no specific rules for acceptance and prioritization of presentation contexts and the Centricity RA600/CA1000/DHC Connection Service will accept all presentation contexts that match those listed in the table shown above.

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3.1.3.2 Receive Images from a Remote System

3.1.3.2.1 Associated Real World Activity

A remote system wants to send images to the Centricity RA600/CA1000/DHC system via the Centricity RA600/CA1000/DHC Connection Service. Once the transfer is completed the new images will automatically be included in the user's view of the local database of Centricity RA600/CA1000/DHC and can be selected for display.

3.1.3.2.2 Accepted Presentation Contexts

Presentation Context Table for Receive From Remote System				
Abstract Syntax		Transfer Syntax	Role	Extended
Name	UID			Negotiation
CR Image	1.2.840.10008.5.1.4.1.1.1	See UID list A below	SCP	None
DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1	See UID list A below	SCP	None
DX Image (Process)	1.2.840.10008.5.1.4.1.1.1.1.1	See UID list A below	SCP	None
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2	See UID list A below	SCP	None
DX Mammography Image (Process)	1.2.840.10008.5.1.4.1.1.1.2.1	See UID list A below	SCP	None
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3	See UID list A below	SCP	None
DX Intra-oral Image (Process)	1.2.840.10008.5.1.4.1.1.1.3.1	See UID list A below	SCP	None
CT Image	1.2.840.10008.5.1.4.1.1.2	See UID list A below	SCP	None
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3	See UID list A below	SCP	None
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	See UID list A below	SCP	None
MR Image	1.2.840.10008.5.1.4.1.1.4	See UID list A below	SCP	None
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5	See UID list A below	SCP	None
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6	See UID list A below	SCP	None
US Image	1.2.840.10008.5.1.4.1.1.6.1	See UID list A below	SCP	None
SC Image	1.2.840.10008.5.1.4.1.1.7	See UID list A below	SCP	None
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1	See UID list A below	SCP	None
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2	See UID list A below	SCP	None
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3	See UID list A below	SCP	None
Multi-Frame True Color SC Image	1.2.840.10008.5.1.4.1.1.7.4	See UID list A below	SCP	None
Standalone Overlay	1.2.840.10008.5.1.4.1.1.8	See UID list B below	SCP	None
Standalone Curve	1.2.840.10008.5.1.4.1.1.9	See UID list B below	SCP	None
12-lead ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.1	See UID list B below	SCP	None
General ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2	See UID list B below	SCP	None
Ambulatory ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2	See UID list B below	SCP	None
Hemodynamic Waveform	1.2.840.10008.5.1.4.1.1.9.2.1	See UID list B below	SCP	None
Cardiac Electrophysiology Waveform	1.2.840.10008.5.1.4.1.1.9.3.1	See UID list B below	SCP	None
Basic Voice Audio Waveform	1.2.840.10008.5.1.4.1.1.9.4.1	See UID list B below	SCP	None
Standalone Modality LUT	1.2.840.10008.5.1.4.1.1.10	See UID list B below	SCP	None
Standalone VOI LUT	1.2.840.10008.5.1.4.1.1.11	See UID list B below	SCP	None
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1	See UID list B below	SCP	None
XA Image	1.2.840.10008.5.1.4.1.1.12.1	See UID list A below	SCP	None
XF Image	1.2.840.10008.5.1.4.1.1.12.2	See UID list A below	SCP	None
NM Image	1.2.840.10008.5.1.4.1.1.20	See UID list A below	SCP	None
Raw Data	1.2.840.10008.5.1.4.1.1.66	See UID list B below	SCP	None
VL Image (Retired)	1.2.840.10008.5.1.4.1.1.77.1	See UID list A below	SCP	None
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2	See UID list A below	SCP	None
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1	See UID list A below	SCP	None
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2	See UID list A below	SCP	None
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3	See UID list A below	SCP	None
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4	See UID list A below	SCP	None
Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11	See UID list B below	SCP	None
Enhanced Structured Reports	1.2.840.10008.5.1.4.1.1.88.22	See UID list B below	SCP	None

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Comprehensive Structured Reports	1.2.840.10008.5.1.4.1.1.88.33	See UID list B below	SCP	None
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40	See UID list B below	SCP	None
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	See UID list B below	SCP	None
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	See UID list B below	SCP	None
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	See UID list B below	SCP	None
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	See UID list B below	SCP	None
Encapsulated PDF	1.2.840.10008.5.1.4.1.1.104.1	See UID list B below	SCP	None
PET Image	1.2.840.10008.5.1.4.1.1.128	See UID list A below	SCP	None
Standalone PET Curve	1.2.840.10008.5.1.4.1.1.129	See UID list B below	SCP	None
RT Image	1.2.840.10008.5.1.4.1.1.481.1	See UID list A below	SCP	None
RT Dose	1.2.840.10008.5.1.4.1.1.481.2	See UID list B below	SCP	None
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	See UID list B below	SCP	None
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4	See UID list B below	SCP	None
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	See UID list B below	SCP	None
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6	See UID list B below	SCP	None
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7	See UID list B below	SCP	None
GE Collage	1.2.528.1.1001.5.1.1.1	See UID list B below	SCP	None
GE AW 3D	1.2.840.113619.4.26	See UID list B below	SCP	None
GE eNTEGRA	1.2.840.113619.4.27	See UID list B below	SCP	None
GE AW Raw Data	1.2.840.113619.4.30	See UID list B below	SCP	None

UID List A:

Transfer Syntaxes for Reception of Image type IODs From Remote System	
Name	**UID**
Implicit VR, Little Endian	1.2.840.10008.1.2
Explicit VR, Little Endian	1.2.840.10008.1.2.1
Explicit VR, Big Endian	1.2.840.10008.1.2.2
Explicit VR, Lossy JPEG 8-Bit Image Compression	1.2.840.10008.1.2.4.50
Explicit VR, Lossy JPEG 12-Bit Image Compression	1.2.840.10008.1.2.4.51
Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
Explicit VR, JPEG 2000 (Lossless Only) Transfer	1.2.840.10008.1.2.4.90
Explicit VR, JPEG 2000 Transfer	1.2.840.10008.1.2.4.91
Explicit VR, RLE Lossless compression	1.2.840.10008.1.2.5
Explicit VR, AMI Wavelet Progressive Lossy Compression	1.2.528.1.1001.4.1.1.2
Explicit VR, AMI JPEG Lossy Compression 8-bit	1.2.528.1.1001.4.2.1.1
Explicit VR, AMI JPEG Lossy Compression 12-bit	1.2.528.1.1001.4.2.1.2
Explicit VR, AMI ZLIB Lossless Compression	1.2.528.1.1001.4.4.1

UID List B:

Transfer Syntaxes for Reception of non-image type IODs FromRemote System	
Name	**UID**
Implicit VR, Little Endian	1.2.840.10008.1.2
Explicit VR, Little Endian	1.2.840.10008.1.2.1
Explicit VR, Big Endian	1.2.840.10008.1.2.2

Note: Centricity RA600/CA1000/DHC is able to receive a large number of IODs. However, Centricity RA600/CA1000/DHC will not always apply the intended behavior, described in the DICOM 3.0 2003 standard, for all of the IODs. IODs marked with a * symbol can only be received, stored, queried for and retrieved, and their contents can be displayed in a generic way. See section 3.1 DICOM Services AE Specifications for a detailed description of the visualization capabilities.

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3.1.3.2.3 SOP Specific Conformance Statement for SOP Class Storage

The Centricity RA600/CA1000/DHC Connection Service conforms to the full (level 2) conformance of the Storage SOP class. All Type 1, Type 2 and Type 3 attributes will be retained. In addition private attributes will be stored and included when the image is sent out again.

Upon successful storage of images of a study or series it may automatically be transferred to another system. The Centricity RA600/CA1000/DHC system can be configured such to automatically delete studies or series from its local database when certain criteria are met.

When an image is received that has a SOP Instance UID (0008,0018) that is already present in the Centricity RA600/CA1000/DHC database the transfers itself will complete successfully but the existing image in the database will be kept and the newly received image will be discarded.

When receiving images they will by default be stored in the (compressed, big/little endian) form they arrived. Upon further transmission of lossy compressed images decompression could take place if the negotiation results in an uncompressed or lossless compressed transfer syntax. The receiving system will have to check the Lossy Compression attribute (0028,1210) in order to verify that there was decompression loss when this image was created.
Centricity RA600/CA1000/DHC will display the contents of attribute “Derivation Description” (0008,2111) or a descriptive text indicating prior compression loss along with the images, to ensure that the user is aware of the fact that derived pixel data is shown.

There is an option to automatically decompress lossy JPEG compressed images upon receiving, which is only there for performance reasons. The attribute Lossy Compression will be set to “01” and never changed ever after. The attribute “Derivative Description” (0008,2111) keeps its original contents and should still be displayed while viewing the images in third party applications.

Centricity RA600/CA1000/DHC offers support for key images, adhering Supplement 59 of the DICOM 3.0 standard. In addition it is able to treat legacy Key Image labels of Image IODs, added by prior versions of Centricity RA600/CA1000/DHC (i.e. when an image contains the attribute “Image Type” (0008,0008) which includes “KEY_IMAGE” as one of the multiple values then Centricity RA600/CA1000/DHC will treat it as a Key Image).

Centricity RA600/CA1000/DHC is able to receive and send any type of (color) image, i.e. images will not be rejected based on the value of tag Photometric Interpretation (0028,0004). However, Centricity RA600/CA1000/DHC will only be able to display images with Photometric interpretation “MONOCHROME1”, “MONOCHROME2”, “RGB”, “PALETTE COLOR”, “YBR_FULL” and “YBR_FULL_422”. For RGB and YBR_FULL images both planar configuration 0 (Color By Plane) and 1 (Color by Pixel) can be displayed.

3.1.3.2.4 Presentation Context Acceptance Criterion

There are no specific rules for acceptance and prioritization of presentation contexts and the Centricity RA600/CA1000/DHC Connection Service will accept all presentation contexts that match those listed in the table shown above. It will however limit a certain SCU to only one association at a time. This means that when a SCU tries to initiate a request while any previous associations that it made are not completely processed that association will be accepted but actual data transfer will be postponed until all previous associations are completed.

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Centricity RA600/CA1000/DHC will accept the first Transfer Syntax from the list it accepts. In case of problems there are configuration options to turn off the acceptance of one or more specific Transfer Syntaxes, in order to make Centricity RA600/CA1000/DHC select a different Transfer Syntax.

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3.1.3.3 Query the Centricity RA600/CA1000/DHC Database

3.1.3.3.1 Associated Real World Activity

A remote system wants to see which studies are available on the Centricity RA600/CA1000/DHC system and issues a query.

3.1.3.3.2 Accepted Presentation Contexts

Presentation Context Table for local Database Query					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Patient Root Query/ Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		
Study Root Query/ Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.3.3.3 SOP Specific Conformance Statement for SOP Class Query

The Centricity RA600/CA1000/DHC Database Service does not support relational queries. The following keys are by default[24] supported for the Patient Root Query/Retrieve:

Level	Description	Tag
PATIENT	Specific Character Set	(0008,0005)
PATIENT	Patient Name	(0010,0010)
PATIENT	Patient ID	(0010,0020)
PATIENT	Other Patient Ids	(0010,1000)
PATIENT	Patients Date of Birth	(0010,0030)
PATIENT	Patients Sex	(0010,0040)
STUDY	Specific Character Set	(0008,0005)
STUDY	Study Date	(0008,0020)
STUDY	Study Time	(0008,0030)
STUDY	Accession Number	(0008,0050)
STUDY	Modalities in Study	(0008,0061)
STUDY	Referring Physician	(0008,0090)
STUDY	Study Description	(0008,1030)
STUDY	Patient Name	(0010,0010)
STUDY	Patient ID	(0010,0020)
STUDY	Study UID	(0020,000D)
STUDY	Study ID	(0020,0010)
STUDY	Study Status ID	(0032,000A)
STUDY	Reading Physician	(0008,1060)
STUDY	Reason for Study	(0032,1030)
STUDY	Number of Study Related Series	(0020,1206)
STUDY	Number of Study Related Instances/Images	(0020,1208)
STUDY	Retrieve AE Title	(0008,0054)
STUDY	Instance availability	(0008,0056)
SERIES	Specific Character Set	(0008,0005)

[24] System integrators can configure Centricity RA600/CA1000/DHC in a way that any DICOM tag (public/private) can be queried for, on any level.

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SERIES	Modality	(0008,0060)
SERIES	Performing Physician	(0008,1050)
SERIES	Body Part	(0018,0015)
SERIES	Patient Position	(0018,5100)
SERIES	Series UID	(0020,000E)
SERIES	Series Number	(0020,0011)
SERIES	Laterality	(0020,0060)
SERIES	Series Date	(0008,0021)
SERIES	Series Time	(0008,0031)
SERIES	Description	(0008,103E)
SERIES	Protocol	(0018,1030)
SERIES	View Position	(0018,5101)
SERIES	Frame of Reference UID	(0020,0052)
SERIES	Smallest Pixel Value in Series	(0028,0108)
SERIES	Largest Pixel Value in Series	(0028,0109)
SERIES	Institution Name	(0008,0080)
SERIES	Station Name	(0008,1010)
SERIES	Number of Series Related Instances/Images	(0020,1209)
SERIES	Institutional Department Name	(0008,1040)
IMAGE	Repetition Time	(0018,0080)
IMAGE	Echo Time	(0018,0081)
IMAGE	Specific Character Set	(0008,0005)
IMAGE	SOP Class UID	(0008,0016)
IMAGE	SOP Instance UID	(0008,0018)
IMAGE	Image Number	(0020,0013)
IMAGE	Rows	(0028,0010)
IMAGE	Columns	(0028,0011)
IMAGE	Patient Orientation	(0020,0037)
IMAGE	Image Type	(0008,0008)
IMAGE	Derivation Description	(0008,2111)
IMAGE	Slice Thickness	(0018,0050)
IMAGE	Imager Pixel Spacing	(0018,1164)
IMAGE	Image Position (Patient)	(0020,0032)
IMAGE	Pixel Spacing	(0028,0030)
IMAGE	Pixel Aspect Ratio	(0028,0034)
IMAGE	Smallest Image Pixel Value	(0028,0106)
IMAGE	Largest Image Pixel Value	(0028,0107)
IMAGE	Window Center	(0028,1050)
IMAGE	Window Width	(0028,1051)
IMAGE	Window Center & Width Explanation	(0028,1055)
IMAGE	Lossy Image Compression	(0028,2110)
IMAGE	Rescale Intercept	(0028,1052)
IMAGE	Rescale Slope	(0028,1053)
IMAGE	Rescale Type	(0028,1054)
IMAGE	Contrast/Bolus Agent	(0018,0010)
IMAGE	Patient Orientation	(0020,0020)
IMAGE	Acquisition Number	(0020,0012)
IMAGE	Slice Location	(0020,1041)
IMAGE	Instance Creation Date	(0008,0012)
IMAGE	Instance Creation Time	(0008,0013)
IMAGE	Presentation Label	(0070,0080)
IMAGE	Presentation Description	(0070,0081)
IMAGE	Presentation Creation Date	(0070,0082)
IMAGE	Presentation Creation Time	(0070,0083)
IMAGE	Presentation Creator's Name	(0070,0084)
IMAGE	Completion Flag	(0040,A491)
IMAGE	Verification Flag	(0040,A493)
IMAGE	Content Date	(0008,0023)
IMAGE	Content Time	(0008,0033)

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IMAGE	Verification Date/Time	(0040,A030)

The following keys are by default[25] supported for the Study Root Query/Retrieve:

Level	Description	Tag
STUDY	Specific Character Set	(0008,0005)
STUDY	Patient Name	(0010,0010)
STUDY	Patient ID	(0010,0020)
STUDY	Other Patient Ids	(0010,1000)
STUDY	Patients Date of Birth	(0010,0030)
STUDY	Patients Sex	(0010,0040)
STUDY	Study Date	(0008,0020)
STUDY	Study Time	(0008,0030)
STUDY	Accession Number	(0008,0050)
STUDY	Modalities in Study	(0008,0061)
STUDY	Referring Physician	(0008,0090)
STUDY	Study Description	(0008,1030)
STUDY	Patient Name	(0010,0010)
STUDY	Patient ID	(0010,0020)
STUDY	Study UID	(0020,000D)
STUDY	Study ID	(0020,0010)
STUDY	Study Status ID	(0032,000A)
STUDY	Reading Physician	(0008,1060)
STUDY	Reason for Study	(0032,1030)
STUDY	Number of Study Related Series	(0020,1206)
STUDY	Number of Study Related Instances/Images	(0020,1208)
STUDY	Retrieve AE Title	(0008,0054)
STUDY	Instance availability	(0008,0056)
SERIES	Specific Character Set	(0008,0005)
SERIES	Modality	(0008,0060)
SERIES	Performing Physician	(0008,1050)
SERIES	Body Part	(0018,0015)
SERIES	Patient Position	(0018,5100)
SERIES	Series UID	(0020,000E)
SERIES	Series Number	(0020,0011)
SERIES	Laterality	(0020,0060)
SERIES	Series Date	(0008,0021)
SERIES	Series Time	(0008,0031)
SERIES	Description	(0008,103E)
SERIES	Protocol	(0018,1030)
SERIES	View Position	(0018,5101)
SERIES	Frame of Reference UID	(0020,0052)
SERIES	Smallest Pixel Value in Series	(0028,0108)
SERIES	Largest Pixel Value in Series	(0028,0109)
SERIES	Institution Name	(0008,0080)
SERIES	Station Name	(0008,1010)
SERIES	Number of Series Related Instances/Images	(0020,1209)
SERIES	Institutional Department Name	(0008,1040)
SERIES	Number of Series Related Instances/Images	(0020,1209)
IMAGE	Repetition Time	(0018,0080)
IMAGE	Echo Time	(0018,0081)
IMAGE	Specific Character Set	(0008,0005)
IMAGE	SOP Class UID	(0008,0016)
IMAGE	SOP Instance UID	(0008,0018)

[25] System integrators can configure Centricity RA600/CA1000/DHC in a way that any DICOM tag (public/private) can be queried for, on any level.

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IMAGE	Image Number	(0020,0013)
IMAGE	Rows	(0028,0010)
IMAGE	Columns	(0028,0011)
IMAGE	Patient Orientation	(0020,0037)
IMAGE	Image Type	(0008,0008)
IMAGE	Derivation Description	(0008,2111)
IMAGE	Slice Thickness	(0018,0050)
IMAGE	Imager Pixel Spacing	(0018,1164)
IMAGE	Image Position (Patient)	(0020,0032)
IMAGE	Pixel Spacing	(0028,0030)
IMAGE	Pixel Aspect Ratio	(0028,0034)
IMAGE	Smallest Image Pixel Value	(0028,0106)
IMAGE	Largest Image Pixel Value	(0028,0107)
IMAGE	Window Center	(0028,1050)
IMAGE	Window Width	(0028,1051)
IMAGE	Window Center & Width Explanation	(0028,1055)
IMAGE	Lossy Image Compression	(0028,2110)
IMAGE	Rescale Intercept	(0028,1052)
IMAGE	Rescale Slope	(0028,1053)
IMAGE	Rescale Type	(0028,1054)
IMAGE	Contrast/Bolus Agent	(0018,0010)
IMAGE	Patient Orientation	(0020,0020)
IMAGE	Acquisition Number	(0020,0012)
IMAGE	Slice Location	(0020,1041)
IMAGE	Instance Creation Date	(0008,0012)
IMAGE	Instance Creation Time	(0008,0013)
IMAGE	Presentation Label	(0070,0080)
IMAGE	Presentation Description	(0070,0081)
IMAGE	Presentation Creation Date	(0070,0082)
IMAGE	Presentation Creation Time	(0070,0083)
IMAGE	Presentation Creator's Name	(0070,0084)
IMAGE	Completion Flag	(0040,A491)
IMAGE	Verification Flag	(0040,A493)
IMAGE	Content Date	(0008,0023)
IMAGE	Content Time	(0008,0033)
IMAGE	Verification Date/Time	(0040,A030)

The following types of attribute matching are supported:

Matching methods for Study/Patient Root Query SCP
Method
Single Value Matching
Universal Matching
Wild Card Matching
Range Matching

3.1.3.3.4 Presentation Context Acceptance Criterion

There are no specific rules for acceptance and prioritization of presentation contexts and the Centricity RA600/CA1000/DHC Connection Service will accept all presentation contexts that match those listed in the table shown above.

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3.1.3.4 Retrieve from the Centricity RA600/CA1000/DHC Database

3.1.3.4.1 Associated Real World Activity

A remote system wants to receive data available on the Centricity RA600/CA1000/DHC system and issues a retrieve command.

3.1.3.4.2 Accepted Presentation Contexts

Presentation Context Table for local Database Query					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Study Root Query/ Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR, Little Endian Implicit VR, Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None

3.1.3.4.3 SOP Specific Conformance Statement for SOP Class Retrieve

The Centricity RA600/CA1000/DHC Connection Service provides standard conformance.

In addition all images and other IODs of a study or series can be retrieved by providing a single Study Instance UID or a Study Instance UID with a Series Instance UID.

3.1.3.4.4 Presentation Context Acceptance Criterion

Centricity RA600/CA1000/DHC Connection Service will only accept retrieve requests from DICOM systems for which it has been configured. There are no specific rules for acceptance and prioritization of presentation contexts.

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3.1.3.5 Commit Storage of Images in the Centricity RA600/CA1000/DHC Database

3.1.3.5.1 Associated Real World Activity

Centricity RA600/CA1000/DHC can confirm the storage (availability) of images on the local system when it is asked to do so. Note however that Centricity RA600/CA1000/DHC does not provide long term archiving and that therefore there is no guarantee that the committed images will remain on the system for a longer period of time (see also below).

3.1.3.5.2 Accepted Presentation Contexts

Presentation Context Table for Storage Commitment Push Model					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name**	**UID**		**Negotiation**
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.3.5.3 SOP Specific Conformance Statement for SOP Class Storage Commitment Push Model

Centricity RA600/CA1000/DHC provides standard conformance.

Centricity RA600/CA1000/DHC will open a new association to the SCU for transmitting the response back and will not transmit the response using the association over which the storage commitment request was sent by the SCU (even if it is still open at the time of sending the response back). Thus the N-EVENT-REPORT will occur on a different association than the N-ACTION operation.

3.1.3.5.3.1 Operations

Centricity RA600/CA1000/DHC only provides temporary commitment for the storage of images. This means that the system can be configured to auto delete studies based on priority rules. Centricity RA600/CA1000/DHC offers a user interface to delete studies.
Additionally Centricity RA600/CA1000/DHC has a Delete Lock mechanism preventing studies to be auto-deleted or accidentally deleted by the user.

Centricity RA600/CA1000/DHC should not be used as a long-term archive. If you want Centricity RA600/CA1000/DHC to retain the received studies (e.g. send them to a long-term storage after Centricity RA600/CA1000/DHC no longer needs it), it needs to be configured as such.

Centricity RA600/CA1000/DHC supports the Referenced Study Component Sequence Attribute by treating it as a Study Instance UID (0020,000D), which is used to speed up the search for the requested objects. When no objects are found with this Study UID, or the Referenced Study Component Sequence Attribute was not present in the request, the complete database is searched for the requested objects.

Committed images can be retrieved via the normal Query/Retrieve mechanism.

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3.1.3.5.3.2 Notifications

Upon receiving a storage commitment request Centricity RA600/CA1000/DHC will first wait for a configurable interval (5 seconds by default). It will then verify up to configurable number of retries (3 by default), separated by a configurable interval (15 seconds by default), whether the requested objects are stored on the system. After a fully successful verification (all requested objects could be verified) it will send a N-EVENT-REPORT back to the requester on a dedicated association, reporting storage commitment. If after the last retry not all objects could be verified an N-EVENT-REPORT message is sent back with a list of committed objects and a list of uncommitted objects.

Centricity RA600/CA1000/DHC does not support the optional Storage Media File-Set ID and UID attributes.
Centricity RA600/CA1000/DHC does not support the optional Retrieve AE Title (0008,0054) for storage Commitment N-EVENT-REPORTs.

3.1.3.5.4 Presentation Context Acceptance Criterion

There are no specific rules for acceptance and prioritization of presentation contexts and Centricity RA600/CA1000/DHC will accept all presentation contexts that match those listed in the table shown above.

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3.1.3.6 Receive a Study Status Change Request from a Remote System

3.1.3.6.1 Associated Real World Activity

3.1.3.6.2 Accepted Presentation Contexts

Presentation Context Table for Detached Study Management					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Detached Study Management	1.2.840.10008.3.1.2.3.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.3.6.3 SOP Specific Conformance Statement for SOP Class Detached Study Management

Centricity RA600/CA1000/DHC provides standard conformance.

3.1.3.6.3.1 Operations

Upon receiving an N-SET command containing the Study UID involved and the new Study Status ID for the study, the Centricity RA600/CA1000/DHC Connection Service will request the study status change from the Centricity RA600/CA1000/DHC Database Service. It will report an error if the study was not found.

3.1.3.6.4 Presentation Context Acceptance Criterion

There are no specific rules for acceptance and prioritization of presentation contexts and Centricity RA600/CA1000/DHC will accept all presentation contexts that match those listed in the table shown above.

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3.1.3.7 Receive a Study Status Change Event from a Remote System

3.1.3.7.1 Associated Real World Activity

3.1.3.7.2 Accepted Presentation Contexts

Presentation Context Table for Detached Study Management					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Detached Study Management	1.2.840.10008.3.1.2.3.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.3.7.3 SOP Specific Conformance Statement for SOP Class Detached Study Management.

Centricity RA600/CA1000/DHC provides standard conformance.

3.1.3.7.3.1 Operations

Upon receiving an N-EVENT-REPORT command containing the Study UID involved and the new Study Status ID for the study, the Centricity RA600/CA1000/DHC Connection Service will request the study status change from the Centricity RA600/CA1000/DHC Database Service.

3.1.3.7.4 Presentation Context Acceptance Criterion

Centricity RA600/CA1000/DHC Connection Service will only accept retrieve requests from DICOM systems for which it has been configured. There are no specific rules for acceptance and prioritization of presentation contexts.

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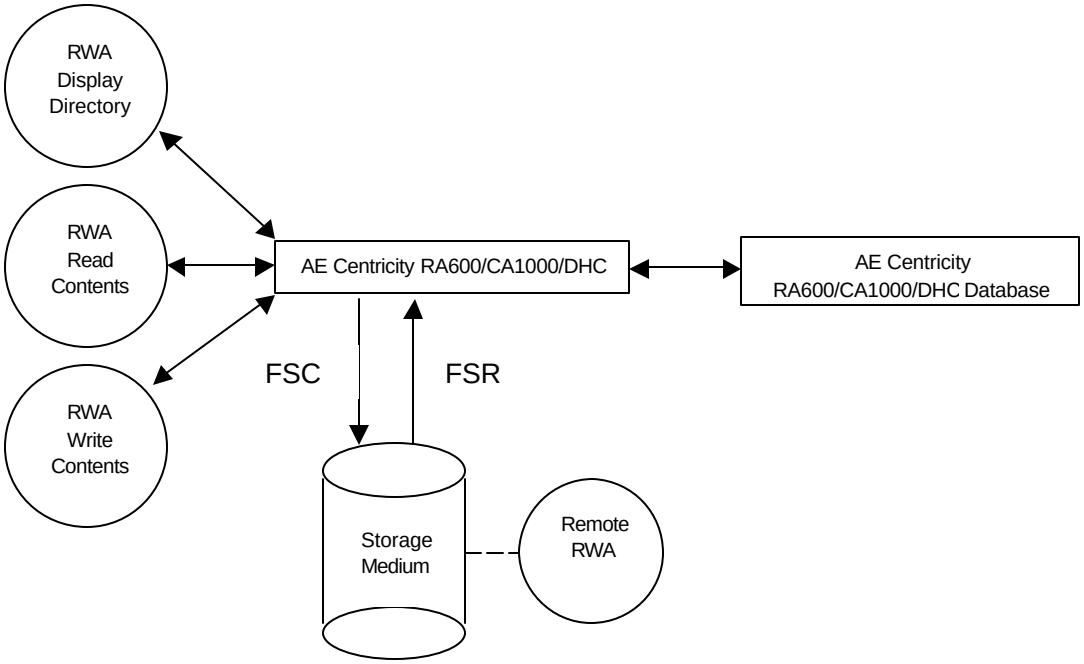
3.2 Centricity RA600/CA1000/DHC DICOM Media Server AE

Centricity RA600/CA1000/DHC provides standard conformance to the DICOM Media Storage Service and File Format (PS 3.10) and the Media Storage Application Profiles (PS 3.11) as far as the reading of uncompressed and JPEG Lossless Non-Hierarchical First Order Prediction compressed images on CD-Recordable media is concerned.

3.2.1 Implementation Model

3.2.1.1 Application Data Flow Diagram



The Centricity RA600/CA1000/DHC Media Server application flow consists of the following items:

- The Centricity RA600/CA1000/DHC front-end application serves both as a FSC and a FSR. In this role it is able to read directory information from the storage medium, to import images from the storage medium and to write images and directory information to the storage medium.
- The three Real World Activities involved are available through the Centricity RA600/CA1000/DHC AE's user interface.

Centricity RA600/CA1000/DHC does not support writing of multi session CD-R disks.

3.2.1.2 File Meta Information Options

The Implementation Class UID is 1.2.528.1.1001.2.20060808.1
The Implementation Version Name is "GEHC_DCM06_1"

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3.2.2 AE Specifications

3.2.2.1 Centricity RA600/CA1000/DHC Application Entity Specification

Centricity RA600/CA1000/DHC supports the following Standard Application Profiles, defined in DICOM 3.11 Annex A - E:

Supported Application Profile	
Description	Identifier
General Purpose CD-R Image Interchange profile	STD-GEN-CD
General Purpose DVD-RAM Image Interchange profile	STD-GEN-DVD-RAM
Basic Cardiac X-Ray Angiographic Studies on CD-R Media	STD-XABC-CD
1024 X-Ray Angiographic Studies on CD-R Media	STD-XA1K-CD[26]
Image Display Image Display	STD-US-ID-SF-CDR STD-US-ID-SF-DVD-RAM
Image Display	STD-US-ID-MF-CDR
Image Display	STD-US-ID-MF-DVD-RAM
Spatial Calibration	STD-US-SC-SF-CDR
Spatial Calibration	STD-US-SC-SF-DVD-RAM
Spatial Calibration	STD-US-SC-MF-CDR
Spatial Calibration	STD-US-SC-MF-DVD-RAM
CT/MR Studies on CD-R	STD-CTMR-CD
CT/MR Studies on DVD-RAM	STD-CTMR-DVD-RAM

In addition Centricity RA600/CA1000/DHC supports the following application profiles, described in Annex A-C

Supported Application Profile	
Description	Identifier
GE Healthcare Private Uncompressed – CDR	PRI-GEMS-UNCOMPRESSED-CDR
GE Healthcare Private JPEG lossless compressed - CDR	PRI-GEMS-COMPRESSED-CDR
GE Healthcare Private Uncompressed – DVD-RAM GE Healthcare Private JPEG lossless compressed – DVD-RAM	PRI-GEMS-UNCOMPRESSED-DVD-RAM PRI-GEMS-COMPRESSED-DVD-RAM
GE Healthcare Private CVIS Ex change – CDR	PRI-GEMS-CVIS-EXCHANGE
GE Healthcare Private CVIS Archive – CDR	PRI-GEMS-CVIS-ARCHIVE

26 Unlike previous versions of Centricity RA600/CA1000/DHC the Profile STD-XA1K-CD now supports the storage of Grayscale Softcopy Presentation State IODs and RGB Secondary Capture IODs on the media.

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3.2.2.2 Real-World Activities

Centricity RA600/CA1000/DHC supports the following Real World Activities within the profile mentioned above:

Real World Activities and roles[27]			
Supported Application Profiles	**Real World Activity**	**Role**	**SC Option**
STD-GEN-CD STD-GEN-DVD-RAM STD-XABC-CD STD-XA1K-CD STD-US-ID-SF-CDR STD-US-ID-SF-DVD-RAM STD-US-ID-MF-CDR STD-US-ID-MF-DVD-RAM STD-US-SC-SF-CDR STD-US-SC-SF-DVD-RAM STD-US-SC-MF-CDR STD-US-SC-MF-DVD-RAM STD-US-CC-SF-CDR STD-US-CC-SF-DVD-RAM STD-US-CC-MF-CDR STD-US-CC-MF-DVD-RAM STD-CTMR-CD STD-CTMR-DVD-RAM PRI-GEMS-UNCOMPRESSED PRI-GEMS-COMPRESSED PRI-GEMS-CVIS-EXCHANGE PRI-GEMS-CVIS-ARCHIVE	Display Directory of CD-R disk	FSR	Interchange
	Read image(s) from CD-R disk	FSR	Interchange
	Write image(s) on CD-R disk	FSC	Interchange

3.2.2.2.1 Real World Activity: Display Directory of CD-R disk

Centricity RA600/CA1000/DHC will act as a FSR when reading the directory of the medium. This will result in an overview of the patients, studies, series and images in Centricity RA600/CA1000/DHC.

The display is structured in one of the following ways:

Types of queries	
Type of query	**Levels**
Study Root Query	Study, Series, Image
Patient Root Query	Patient, Study, Series, Image

At least the Patient Name and Patient ID fields are necessary for a correct display of the directory information. The following DICOMDIR keys are used for the user to be able to distinguish between the objects.
Reading of the directory contents is a standard feature of Centricity RA600/CA1000/DHC.

3.2.2.2.2 Real World Activity Read images from CD-R disk

[27] The Centricity RA600/CA1000/DHC software allows for more flexibility than this profile describes. Documentation for extended configuration is available.

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Centricity RA600/CA1000/DHC will act as a FSR when reading all/selected images from the CD-R medium. This feature will be available through the Import command or the View command from the Remote View area.

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Centricity RA600/CA1000/DHC is able to read images/instances only if they belong to one of the following SOP classes:

SOP classes for import of DICOM Part 10 images	
Name	**UID**
CR Image	1.2.840.10008.5.1.4.1.1.1
DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1
DX Image (Process)	1.2.840.10008.5.1.4.1.1.1.1.1
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2
DX Mammography Image (Process)	1.2.840.10008.5.1.4.1.1.1.2.1
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3
DX Intra-oral Image (Process)	1.2.840.10008.5.1.4.1.1.1.3.1
CT Image	1.2.840.10008.5.1.4.1.1.2
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1
MR Image	1.2.840.10008.5.1.4.1.1.4
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6
US Image	1.2.840.10008.5.1.4.1.1.6.1
SC Image	1.2.840.10008.5.1.4.1.1.7
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3
Multi-Frame True Color SC Image	1.2.840.10008.5.1.4.1.1.7.4
Standalone Overlay	1.2.840.10008.5.1.4.1.1.8
Standalone Curve	1.2.840.10008.5.1.4.1.1.9
12-lead ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2
Hemodynamic Waveform	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Audio Waveform	1.2.840.10008.5.1.4.1.1.9.4.1
Standalone Modality LUT	1.2.840.10008.5.1.4.1.1.10
Standalone VOI LUT	1.2.840.10008.5.1.4.1.1.11
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1
XA Image	1.2.840.10008.5.1.4.1.1.12.1
XF Image	1.2.840.10008.5.1.4.1.1.12.2
NM Image	1.2.840.10008.5.1.4.1.1.20
Raw Data	1.2.840.10008.5.1.4.1.1.66
VL Image (Retired)	1.2.840.10008.5.1.4.1.1.77.1
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4
Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11
Enhanced Structured Reports	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive Structured Reports	1.2.840.10008.5.1.4.1.1.88.33
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67
Encapsulated PDF	1.2.840.10008.5.1.4.1.1.104.1
PET Image	1.2.840.10008.5.1.4.1.1.128
Standalone PET Curve	1.2.840.10008.5.1.4.1.1.129
RT Image	1.2.840.10008.5.1.4.1.1.481.1
RT Dose	1.2.840.10008.5.1.4.1.1.481.2

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RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4
RT Plan	1.2.840.10008.5.1.4.1.1.481.5
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7
GE Collage	1.2.528.1.1001.5.1.1.1
GE AW 3D	1.2.840.113619.4.26
GE eNTEGRA	1.2.840.113619.4.27
GE AW Raw Data	1.2.840.113619.4.30

IODs marked with a * symbol can be imported from CD-R into the local database, but their contents can only be displayed in a generic way. See section 3.1 DICOM Services AE Specifications for a detailed description of the visualization capabilities.

Centricity RA600/CA1000/DHC is able to read images only if they have one of the following transfer syntaxes:

Transfer syntaxes for import of DICOM Part 10 images	
Name	**UID**
Implicit VR, Little Endian	1.2.840.10008.1.2
Explicit VR, Little Endian	1.2.840.10008.1.2.1
Explicit VR, Big Endian	1.2.840.10008.1.2.2
Explicit VR, Lossy JPEG 8-Bit Image Compression	1.2.840.10008.1.2.4.50
Explicit VR, Lossy JPEG 12-Bit Image Compression	1.2.840.10008.1.2.4.51
Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
Explicit VR, RLE Lossless compression	1.2.840.10008.1.2.5

Importing of studies from a DICOM Part 10 Volume is a standard feature of Centricity RA600/CA1000/DHC.

3.2.2.2.3 Real World Activity: Write images

Centricity RA600/CA1000/DHC will act as a FSC when writing all or selected patients, studies or series from the local database view to random access archive media (like MODs). Centricity RA600/CA1000/DHC uses a third party library from VOB Software GMBH to accomplish this. Centricity RA600/CA1000/DHC is able to write images of the following SOP classes:

SOP classes for writing DICOM Part 10 images	
Name	**UID**
CR Image	1.2.840.10008.5.1.4.1.1.1
DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1
DX Image (Process)	1.2.840.10008.5.1.4.1.1.1.1.1
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2
DX Mammography Image (Process)	1.2.840.10008.5.1.4.1.1.1.2.1
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3
DX Intra-oral Image (Process)	1.2.840.10008.5.1.4.1.1.1.3.1
CT Image	1.2.840.10008.5.1.4.1.1.2
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1
MR Image	1.2.840.10008.5.1.4.1.1.4
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6

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US Image	1.2.840.10008.5.1.4.1.1.6.1
SC Image	1.2.840.10008.5.1.4.1.1.7
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3
Multi-Frame True Color SC Image	1.2.840.10008.5.1.4.1.1.7.4
Standalone Overlay	1.2.840.10008.5.1.4.1.1.8
Standalone Curve	1.2.840.10008.5.1.4.1.1.9
12-lead ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2
Hemodynamic Waveform	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Audio Waveform	1.2.840.10008.5.1.4.1.1.9.4.1
Standalone Modality LUT	1.2.840.10008.5.1.4.1.1.10
Standalone VOI LUT	1.2.840.10008.5.1.4.1.1.11
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1
XA Image	1.2.840.10008.5.1.4.1.1.12.1
XF Image	1.2.840.10008.5.1.4.1.1.12.2
NM Image	1.2.840.10008.5.1.4.1.1.20
Raw Data	1.2.840.10008.5.1.4.1.1.66
VL Image (Retired)	1.2.840.10008.5.1.4.1.1.77.1
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4
Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11
Enhanced Structured Reports	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive Structured Reports	1.2.840.10008.5.1.4.1.1.88.33
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67
Encapsulated PDF	1.2.840.10008.5.1.4.1.1.104.1
PET Image	1.2.840.10008.5.1.4.1.1.128
Standalone PET Curve	1.2.840.10008.5.1.4.1.1.129
RT Image	1.2.840.10008.5.1.4.1.1.481.1
RT Dose	1.2.840.10008.5.1.4.1.1.481.2
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4
RT Plan	1.2.840.10008.5.1.4.1.1.481.5
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7
GE Collage	1.2.528.1.1001.5.1.1.1
GE AW 3D	1.2.840.113619.4.26
GE eNTEGRA	1.2.840.113619.4.27
GE AW Raw Data	1.2.840.113619.4.30

Writing studies to a DICOM Part 10 Volume is an optional feature of Centricity RA600/CA1000/DHC, which requires a separate license.

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Centricity RA600/CA1000/DHC creates DICOMDIR files for the DICOM Part 10 Volumes, containing the following keys:

Keys exported to the DICOMDIR File			
Directory Record Type	**Key description**	**Tag**	**Type**
PATIENT	Specific Character Set	(0008,0005)	1C
PATIENT	Patient Name	(0010,0010)	2
PATIENT	Patient ID	(0010,0020)	1
PATIENT	Other Patient Ids	(0010,1000)	3
STUDY	Specific Character Set	(0008,0005)	1C
STUDY	Study Date	(0008,0020)	1
STUDY	Study Time	(0008,0030)	1
STUDY	Accession Number	(0008,0050)	2
STUDY	Modalities in Study	(0008,0061)	3
STUDY	Referring Physician	(0008,0090)	3
STUDY	Study Description	(0008,1030)	3
STUDY	Patient Name	(0010,0010)	2
STUDY	Patient ID	(0010,0020)	1
STUDY	Patients Date of Birth	(0010,0030)	2
STUDY	Patients Sex	(0010,0040)	2
STUDY	Study UID	(0020,000D)	1C
STUDY	Study ID	(0020,0010)	1
STUDY	Study Status ID	(0032,000A)	3
STUDY	Reading Physician	(0008,1060)	3
STUDY	Reason for Study	(0032,1030)	3
SERIES	Specific Character Set	(0008,0005)	1C
SERIES	Modality	(0008,0060)	1
SERIES	Performing Physician	(0008,1050)	3
SERIES	Body Part	(0018,0015)	3
SERIES	Patient Position	(0018,5100)	2C
SERIES	Series UID	(0020,000E)	1
SERIES	Series Number	(0020,0011)	1
SERIES	Laterality	(0020,0060)	3
SERIES	Series Date	(0008,0021)	3
SERIES	Series Time	(0008,0031)	3
SERIES	Description	(0008,103E)	3
SERIES	Protocol	(0018,1030)	3
SERIES	View Position	(0018,5101)	2
SERIES	Frame of Reference UID	(0020,0052)	1
SERIES	Smallest Pixel Value in Series	(0028,0108)	3
SERIES	Largest Pixel Value in Series	(0028,0109)	3
SERIES	Institution Name	(0008,0080)	3
SERIES	Station Name	(0008,1010)	3
SERIES	Institutional Department Name	(0008,1040)	3
IMAGE	Repetition Time	(0018,0080)	2C
IMAGE	Echo Time	(0018,0081)	2
IMAGE	Specific Character Set	(0008,0005)	1C
IMAGE	SOP Class UID	(0008,0016)	1
IMAGE	SOP Instance UID	(0008,0018)	1C
IMAGE	Image Number	(0020,0013)	1
IMAGE	Rows	(0028,0010)	3
IMAGE	Columns	(0028,0011)	3
IMAGE	Patient Orientation	(0020,0037)	2C
IMAGE	Image Type	(0008,0008)	3
IMAGE	Derivation Description	(0008,2111)	3
IMAGE	Slice Thickness	(0018,0050)	2
IMAGE	Imager Pixel Spacing	(0018,1164)	3
IMAGE	Image Position (Patient)	(0020,0032)	2C

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Keys exported to the DICOMDIR File			
Directory Record Type	**Key description**	**Tag**	**Type**
IMAGE	Pixel Spacing	(0028,0030)	1
IMAGE	Pixel Aspect Ratio	(0028,0034)	1C
IMAGE	Smallest Image Pixel Value	(0028,0106)	3
IMAGE	Largest Image Pixel Value	(0028,0107)	3
IMAGE	Window Center	(0028,1050)	1C
IMAGE	Window Width	(0028,1051)	1C
IMAGE	Window Center & Width Explanation	(0028,1055)	3
IMAGE	Lossy Image Compression	(0028,2110)	3
IMAGE	Rescale Intercept	(0028,1052)	1
IMAGE	Rescale Slope	(0028,1053)	1
IMAGE	Rescale Type	(0028,1054)	1
IMAGE	Contrast/Bolus Agent	(0018,0010)	2
IMAGE	Patient Orientation	(0020,0020)	2C
IMAGE	Acquisition Number	(0020,0012)	3
IMAGE	Slice Location	(0020,1041)	3
IMAGE	Instance Creation Date	(0008,0012)	3
IMAGE	Instance Creation Time	(0008,0013)	3
OVERLAY	Specific Character Set	(0008,0005)	1C
OVERLAY	Overlay Number	(0020,0022)	2
MODALITY LUT	Specific Character Set	(0008,0005)	1C
MODALITY LUT	Lookup table Number	(0020,0026)	1
VOI LUT	Specific Character Set	(0008,0005)	1C
VOI LUT	Lookup table Number	(0020,0026)	1
CURVE	Specific Character Set	(0008,0005)	1C
CURVE	Curve Number	(0020,0024)	1
PRESENTATION	Specific Character Set	(0008,0005)	1C
PRESENTATION	SOP Instance UID	(0008,0018)	1C
PRESENTATION	Instance Number	(0020,0013)	1
PRESENTATION	Presentation Label	(0070,0080)	1
PRESENTATION	Presentation Description	(0070,0081)	2
PRESENTATION	Presentation Creation Date	(0070,0082)	1
PRESENTATION	Presentation Creation Time	(0070,0083)	1
PRESENTATION	Presentation Creator's Name	(0070,0084)	2
PRESENTATION	Referenced Series Sequence	(0008,1115)	1
SR DOCUMENT	Instance Number	(0020,0013)	1
SR DOCUMENT	Completion Flag	(0040,A491)	1
SR DOCUMENT	Verification Flag	(0040,A493)	1
SR DOCUMENT	Content Date	(0008,0023)	1
SR DOCUMENT	Content Time	(0008,0033)	1
SR DOCUMENT	Verification Date/Time	(0040,A030)	1C
SR DOCUMENT	Concept Name Code Sequence	(0040,A043)	1
SR DOCUMENT	Content Sequence	(0040,A730)	1C
RT DOSE	Specific Character Set	(0008,0005)	1C
RT DOSE	SOP Instance UID	(0008,0018)	1C
RT DOSE	Instance Number	(0020,0013)	1
RT DOSE	Dose Summation Type	(3004,000A)	1
RT STRUCTURE SET	Specific Character Set	(0008,0005)	1C
RT STRUCTURE SET	SOP Instance UID	(0008,0018)	1C
RT STRUCTURE SET	Instance Number	(0020,0013)	1
RT STRUCTURE SET	Structure Set Label	(3006,0002)	1
RT STRUCTURE SET	Structure Set Date	(3006,0008)	2
RT STRUCTURE SET	Structure Set Time	(3006,0009)	2
RT PLAN	Specific Character Set	(0008,0005)	1C
RT PLAN	SOP Instance UID	(0008,0018)	1C
RT PLAN	Instance Number	(0020,0013)	1
RT PLAN	RT Plan Label	(300A,0002)	1
RT PLAN	RT Plan Date	(300A,0006)	2

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Keys exported to the DICOMDIR File			
Directory Record Type	**Key description**	**Tag**	**Type**
RT PLAN	RT Plan Time	(300A,0007)	2
RT TREAT RECORD	Specific Character Set	(0008,0005)	1C
RT TREAT RECORD	SOP Instance UID	(0008,0018)	1C
RT TREAT RECORD	Instance Number	(0020,0013)	1
RT TREAT RECORD	Treatment Date	(3008,0250)	2
RT TREAT RECORD	Treatment Time	(3008,0251)	2
KEY OBJECT DOC	Instance Number	(0020,0013)	1
KEY OBJECT DOC	Content Date	(0008,0023)	1
KEY OBJECT DOC	Content Time	(0008,0033)	1

3.2.3 Character Sets

Centricity RA600/CA1000/DHC may change the value of the tag (0008,0005) Character Set on incoming studies before they are written to a DICOM Part 10 Medium. This will only happen if a user operation or automatic merge operation will change an existing IOD. This may lead to multi-valued Character Set values in cases where multiple non-ASCII scripts are used within the same IOD. In case the IODs contents haven't changed, the value for the Character Set (0008,0005) is retained and therefore depends on the system that created the DICOM IOD.

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4 COMMUNICATION PROFILE

4.1 Supported Communication Stacks

The Centricity RA600/CA1000/DHC DICOM services provide DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

4.2 OSI Stack

Not supported.

4.3 TCP/IP Stack

The Centricity RA600/CA1000/DHC DICOM services use the TCP/IP stack from the Microsoft Windows XP operating system on which it executes.

4.3.1 Physical Media Support

The Centricity RA600/CA1000/DHC DICOM services are not dependent on the physical medium over which the TCP/IP executes.

4.4 Point-to-Point Stack

Not supported.

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5 EXTENSIONS / SPECIALIZATIONS / PRIVATIZATIONS

5.1 Standard Extended / Specialized / Private SOPs

5.1.1 GSPS objects referring to colour images

Centricity RA600/CA1000/DHC is able to create Grayscale Softcopy Presentation State IODs containing references to color images. This mechanism is used to store measurements, annotations, and windowing operations and image transformations.

5.1.2 Collage IOD

Centricity RA600/CA1000/DHC is able to create, send, receive and apply private IODs called Collages. Collages comprise a snapshot of the Front-end application, applicable when viewing images of one or more studies. A collage never copies information from images, Presentation states or keynotes, but rather keeps references to these IODs, together with the position and display state. The collage IOD has been defined in terms of a basic structured report but has a separate SOP class UID as it serves a different goal.

Centricity RA600/CA1000/DHC will use the following private SOP class UID to refer to a Collage IOD:

UID Value	UID Name
1.2.528.1.1001.5.1.1.1	GE Collage

5.2 Private Transfer Syntaxes

Centricity RA600/CA1000/DHC is able to use the following private transfer syntaxes for compressed exchange of image type IODs:

Private Transfer Syntaxes for exchange of Image type IODs	
Name	**UID**
Explicit VR, AMI Wavelet Progressive Lossy Compression	1.2.528.1.1001.4.1.1.2
Explicit VR, AMI JPEG Lossy Compression 8-bit	1.2.528.1.1001.4.2.1.1
Explicit VR, AMI JPEG Lossy Compression 12-bit	1.2.528.1.1001.4.2.1.2
Explicit VR, AMI ZLIB Lossless Compression	1.2.528.1.1001.4.4.1

All Transfer Syntaxes listed above are based on the Explicit and Little Endian Transfer syntax, and use the encapsulated form of transferring Pixel Data in tag (7FE0,0010). The Value Representation for the Pixel Data tag will be OB.

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5.3 Private Tags

5.3.1 Private tags created and used in GSPS objects

Private Creator Identification ("Applicare/RadWorks/Version 6.0"))

Attribute Name	Tag	VR	VM
Annotation Type	(4105, XX01)	CS	1
Annotation Value	(4105, XX02)	DS	1
Cutline Image UID	(4105, XX03)	UI	1
Cutline Set UID	(4105, XX04)	UI	1
Annotation Color	(4105, XX05)	US	1
Annotation Line Style	(4105, XX06)	CS	1
Annotation Label	(4105, XX07)	SH	1
Annotation Creator	(4105, XX08)	PN	1
Annotation Creation Date	(4105, XX09)	DA	1
Annotation Creation Time	(4105, XX0A)	TM	1
Annotation Modification Sequence	(4105, XX0B)	SQ	1
Annotation Modifier	(4105, XX0C)	PN	1
Annotation Modification Date	(4105, XX0D)	DA	1
Annotation Modification Time	(4105, XX0E)	TM	1
Palette Color LUT Name	(4105, XX0F)	LO	1
Annotation Number	(4105, XX10)	US	1

Private Creator Identification ("Applicare/RadWorks/Version 6.0"))

Attribute Name	Tag	VR	VM
Requested Palette Color LUT (GSPS)	(4107, XX01)	SQ	1

Private Creator Identification ("Applicare/RadWorks/Version 6.0/Summary"))

Attribute Name	Tag	VR	VM
Receive Origin Description	(3109, XX11)	ST	1

5.3.2 Private tags, read from IODs

Private Creator Identification ("GE LUT Asymmetry Parameter"))

Attribute Name	Tag	VR	VM
LUT Asymmetry	(0045, XX67)	DS	3

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5.3.3 Private tags supported by the Query SCP (Study Level)

Private Creator Identification ("Applicare/RadWorks/Version 5.0"))

Attribute Name	Tag	VR	VM
Receive Origin Description	(3109, XX11)	ST	1
NEW/SEEN Status	(3109, XX02)	SH	1
Delete Lock	(3109, XX03)	CS	1
Receive Origin	(3109, XX08)	LO	1
Folder	(3109, XX09)	LO	1
Receive Date	(3109, XX0A)	DA	1
Receive Time	(3109, XX0B)	TM	1
Requested Compression	(3109, XX34)	CS	1
Study Lock	(3109, XX41)	CS	1
Archive Status	(3109, XX43)	CS	1

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6 CONFIGURATION

The configuration of the Centricity RA600/CA1000/DHC DICOM services is stored in the Windows Registry. Only accounts (secured by passwords) with the right level of security will be able to change the configuration. This will typically be done by support personnel.

6.1 AE Title/Presentation Address Mapping

The AE title shared by the Centricity RA600/CA1000/DHC services and front-end application is configurable and defaults to <hostname>. The port on which the Centricity RA600/CA1000/DHC Connection Service listens is also configurable and defaults to 104.

All remote systems that want to communicate with the Centricity RA600/CA1000/DHC Connection Service have to be configured. For systems that want to act as SCUs of the Connection Service SCP SOP classes the following information may be needed:

- The AE title.
- The host name.
- The port number.

For systems with which the Centricity RA600/CA1000/DHC DICOM services want to act as SCU the following information is needed:

- The AE title.
- The host name.
- The port number.

6.2 Configurable Parameters

Centricity RA600/CA1000/DHC offers configuration of the following parameters, as far as the DICOM Communication is concerned.

Configurable		
Name	**Values**	**Description**
Max. Number of Associations	1…	Maximum number of simultaneous incoming associations accepted by the Connection Service
PDU Packet Size	0 or 4096 – 4194304	Proposed size of PDU packets, both in SCP and SCU role. The value of zero indicates that Centricity RA600/CA1000/DHC is capable to accept PDU packets of any size.
Strict DICOM	True, False	Accept or reject incoming DICOM IODs when they contain type 1 violations.
Send Explicit VR	True, False	Determines whether or not Explicit Little Endian Transfer syntax is proposed when acting as a CStore SCU.

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7 SUPPORT OF EXTENDED CHARACTER SETS

Centricity RA600/CA1000/DHC offers full support for the following character sets (possibly with code extension techniques):

Supported Character Sets	
Name	**Value**
Default Character repertoire ISO IR 6	<none>
single-byte JIS X 0201 (Katakana)	ISO_IR 13, ISO 2022 IR 13
single-byte JIS X 0201 (Romaji)	ISO_IR 14
multi-byte JIS X 0208 (1983)	ISO 2022 IR 87
Latin – 1 character repertoire Latin – 2 character repertoire	ISO_IR 100, ISO 2022 IR 100 ISO_IR 101, ISO 2022 IR 101
Latin – 3 character repertoire	ISO_IR 109, ISO 2022 IR 109
Latin – 4 character repertoire	ISO_IR 110, ISO 2022 IR 110
Greek	ISO_IR 126, ISO 2022 IR 126
Arabic	ISO_IR 127, ISO 2022 IR 127
Hebrew	ISO_IR 138, ISO 2022 IR 138
Cyrillic	ISO_IR 144, ISO 2022 IR 144
Latin – 5 character repertoire	ISO_IR 148, ISO 2022 IR 148
Multibyte KS X 1001	ISO 2022 IR 149
Multibyte JIS X 212	ISO 2022 IR 159

In addition Centricity RA600/CA1000/DHC offers support for the following universal character sets without code extensions:

Supported Universal Character Sets	
Name	**Value**
Unicode in UTF-8	ISO_IR 192
GB18030 (GBK Chinese)	GB18030

The support for reading DICOM data for any of these Universal Character Sets is default behavior. Likewise, Centricity RA600/CA1000/DHC will only write or send DICOM data using these character sets if the original data contained those. By default Centricity RA600/CA1000/DHC is NOT able to create or modify data using these character sets.

Centricity RA600/CA1000/DHC can be configured to create or modify data using either of the universal character sets described above. Please note that the use of these character sets is not yet common in the DICOM community. The use of these character sets can cause the inability to send DICOM data to other DICOM systems (including previous versions of Centricity RA600/CA1000/DHC) or DICOM Printers.

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Annex A: GE Healthcare Private Uncompressed Application Profile

A.1 CLASS AND PROFILE IDENTIFICATION

Application Profile	Identifier	Description
GE Healthcare Private Uncompressed CDR	PRI-GEMS-UNCOMPRESSED-CDR	General purpose Explicit Little Endian for CDR, without icon-images and with limited DICOMDIR information on image level for CDR
GE Healthcare Private Uncompressed DVD-RAM	PRI-GEMS-UNCOMPRESSED-DVD-RAM	General purpose Explicit Little Endian for CDR, without icon-images and with limited DICOMDIR information on image level for DVD-RAM

A.2 CLINICAL CONTEXT

These profiles allow for generic storage purposes of IODS, with a minimum of DICOMDIR overhead.

A.2.1 ROLES AND SERVICE CLASS OPTIONS SECTION

The Application entity acting as a File-Set Creator generates a File Set under this Application Profile Class for purposes of archiving or exchange with other systems.

The role of File Set Reader shall be used by Application Entities that receive a transferred File Set, typically for review purposes.

The role of File Set Updater is undefined.

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A.3 GENERAL CLASS PROFILE

A.3.1 SOP CLASSES AND TRANSFER SYNTAXES

Information Object Definition	SOP Class UID	Transfer Syntax UID	FSC Req.	FSR Req.	FSU Req.
Basic Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Mand.	Mand.	Mand.
CR Image DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1 1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Opt.	Opt.	Opt.
DX Image (Process)	1.2.840.10008.5.1.4.1.1.1.1.1				
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2				
DX Mammography Image (Process)	1.2.840.10008.5.1.4.1.1.1.2.1				
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3				
DX Intra-oral Image (Process)	1.2.840.10008.5.1.4.1.1.1.3.1				
CT Image	1.2.840.10008.5.1.4.1.1.2				
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3				
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1				
MR Image NM Image (Retired)	1.2.840.10008.5.1.4.1.1.4 1.2.840.10008.5.1.4.1.1.5				
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6				
US Image	1.2.840.10008.5.1.4.1.1.6.1				
SC Image	1.2.840.10008.5.1.4.1.1.7				
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1				
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2				
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3				
Multi-Frame True Color SC Imag	1.2.840.10008.5.1.4.1.1.7.4				
Standalone Overlay	1.2.840.10008.5.1.4.1.1.8				
Standalone Curve	1.2.840.10008.5.1.4.1.1.9				
12-lead ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.1				
General ECG Waveform Ambulatory ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2 1.2.840.10008.5.1.4.1.1.9.1.2				
Hemodynamic Waveform	1.2.840.10008.5.1.4.1.1.9.2.1				
Cardiac Electrophysiology Waveform	1.2.840.10008.5.1.4.1.1.9.3.1				
Basic Voice Audio Waveform	1.2.840.10008.5.1.4.1.1.9.4.1				
Standalone Modality LUT	1.2.840.10008.5.1.4.1.1.10				
Standalone VOI LUT	1.2.840.10008.5.1.4.1.1.11				
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1				
XA Image	1.2.840.10008.5.1.4.1.1.12.1				
XF Image	1.2.840.10008.5.1.4.1.1.12.2				
NM Image	1.2.840.10008.5.1.4.1.1.20				
Raw Data	1.2.840.10008.5.1.4.1.1.66				
VL Image (Retired) VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.1 1.2.840.10008.5.1.4.1.1.77.2				
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1				
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2				
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3				
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4				

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Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11				
Enhanced Structured Reports	1.2.840.10008.5.1.4.1.1.88.22				
Comprehensive Structured Reports	1.2.840.10008.5.1.4.1.1.88.33				
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40				
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50				
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59				
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65				
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67				
Encapsulated PDF	1.2.840.10008.5.1.4.1.1.104.1				
PET Image	1.2.840.10008.5.1.4.1.1.128				
Standalone PET Curve	1.2.840.10008.5.1.4.1.1.129				
RT Image	1.2.840.10008.5.1.4.1.1.481.1				
RT Dose	1.2.840.10008.5.1.4.1.1.481.2				
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3				
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4				
RT Plan	1.2.840.10008.5.1.4.1.1.481.5				
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6				
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7				
GE Collage	1.2.528.1.1001.5.1.1.1				
GE AW 3D	1.2.840.113619.4.26				
GE eNTEGRA	1.2.840.113619.4.27				
GE AW Raw Data	1.2.840.113619.4.30				

A.3.2 PHYSICAL MEDIA AND MEDIA FORMATS

The profiles from this class require either

- the 120mm CD-R ISO/IEC 9660 Media Format, as defined in PS3.12 Annex F, or
- the 120mm DVD-RAM physical media with the DVD-RAM UDF1.5 Media Format, as defined in PS3.12 Annex J

A.3.3 DIRECTORY INFORMATION IN DICOMDIR

The profile is restricted to the following types of Directory Records: PATIENT, STUDY, SERIES, IMAGE, OVERLAY, MODALITY LUT, VOI LUT, CURVE, PRESENTATION, SR DOCUMENT, COLLAGE, RT DOSE, RT STRUCTURE SET, RT PLAN, RT TREAT RECORD, KEY OBJECT DOC

The profile does not impose restrictions or additional keys.
The DICOMDIR file shall contain Icon Images.

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Annex B: GE Healthcare Private Compressed Application Profile

B.1 CLASS AND PROFILE IDENTIFICATION

Application Profile	Identifier	Description
GE Healthcare Private Compressed CDR	PRI-GEMS-COMPRESSED-CDR	General purpose Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction for CDR, without icon-images and with limited DICOMDIR information on image level.
GE Healthcare Private Compressed DVD-RAM	PRI-GEMS-COMPRESSED-DVD-RAM	General Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction for DVD-RAM, without icon-images and with limited DICOMDIR information on image level.

B.2 CLINICAL CONTEXT

These profiles allow for generic storage purposes of IODS, with a minimum of DICOMDIR overhead.

B.2.1 ROLES AND SERVICE CLASS OPTIONS SECTION

The Application entity acting as a File-Set Creator generates a File Set under this Application Profile Class for purposes of archiving or exchange with other systems. The profile is especially useful for systems that do not verify adherence to a profile

The role of File Set Reader shall be used by Application Entities that receive a transferred File Set, typically for review purposes.

The role of File Set Updater is undefined.

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B.3 GENERAL CLASS PROFILE

B.3.1 SOP CLASSES AND TRANSFER SYNTAXES

Information Object Definition	SOP Class UID	Transfer Syntax UID	FSC Req.	FSR Req.	FSU Req.
Basic Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Mand.	Mand.	Mand.
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction 1.2.840.10008.1.2.4.70	Opt.	Opt.	Opt.
DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1				
DX Image (Process)	1.2.840.10008.5.1.4.1.1.1.1.1				
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2				
DX Mammography Image (Process)	1.2.840.10008.5.1.4.1.1.1.2.1				
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3				
DX Intra-oral Image (Process)	1.2.840.10008.5.1.4.1.1.1.3.1				
CT Image	1.2.840.10008.5.1.4.1.1.2				
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3				
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1				
MR Image	1.2.840.10008.5.1.4.1.1.4				
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5				
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6				
US Image	1.2.840.10008.5.1.4.1.1.6.1				
SC Image	1.2.840.10008.5.1.4.1.1.7				
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1				
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2				
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3				
Multi-Frame True Color SC Imag	1.2.840.10008.5.1.4.1.1.7.4				
Standalone Overlay	1.2.840.10008.5.1.4.1.1.8	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1			
Standalone Curve	1.2.840.10008.5.1.4.1.1.9				
12-lead ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.1				
General ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2				
Ambulatory ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2				
Hemodynamic Waveform	1.2.840.10008.5.1.4.1.1.9.2.1				
Cardiac Electrophysiology Waveform	1.2.840.10008.5.1.4.1.1.9.3.1				
Basic Voice Audio Waveform	1.2.840.10008.5.1.4.1.1.9.4.1				
Standalone Modality LUT	1.2.840.10008.5.1.4.1.1.10				
Standalone VOI LUT	1.2.840.10008.5.1.4.1.1.11				
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1				
XA Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction 1.2.840.10008.1.2.4.70			
XF Image	1.2.840.10008.5.1.4.1.1.12.2				
NM Image	1.2.840.10008.5.1.4.1.1.20				
Raw Data	1.2.840.10008.5.1.4.1.1.66	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1			
VL Image (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction 1.2.840.10008.1.2.4.70			
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2				
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1				
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2				
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3				

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VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4				
Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1			
Enhanced Structured Reports	1.2.840.10008.5.1.4.1.1.88.22				
Comprehensive Structured Reports	1.2.840.10008.5.1.4.1.1.88.33				
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40				
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50				
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59				
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65				
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1			
Encapsulated PDF	1.2.840.10008.5.1.4.1.1.104.1				
PET Image	1.2.840.10008.5.1.4.1.1.128	Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction 1.2.840.10008.1.2.4.70			
Standalone PET Curve	1.2.840.10008.5.1.4.1.1.129	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1			
RT Image	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction 1.2.840.10008.1.2.4.70			
RT Dose	1.2.840.10008.5.1.4.1.1.481.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1			
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3				
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4				
RT Plan	1.2.840.10008.5.1.4.1.1.481.5				
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6				
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7				
GE Collage	1.2.528.1.1001.5.1.1.1				
GE AW 3D	1.2.840.113619.4.26				
GE eNTEGRA	1.2.840.113619.4.27				
GE AW Raw Data	1.2.840.113619.4.30				

B.3.2 PHYSICAL MEDIA AND MEDIA FORMATS

The profiles from this class require either

- the 120mm CD-R ISO/IEC 9660 Media Format, as defined in PS3.12 Annex F, or
- the 120mm DVD-RAM physical media with the DVD-RAM UDF1.5 Media Format, as defined in PS3.12 Annex J.

B.3.3 DIRECTORY INFORMATION IN DICOMDIR

The profile is restricted to the following types of Directory Records: PATIENT, STUDY, SERIES, IMAGE, OVERLAY, MODALITY LUT, VOI LUT, CURVE, PRESENTATION, SR DOCUMENT, COLLAGE, RT DOSE, RT STRUCTURE SET, RT PLAN, RT TREAT RECORD, KEY OBJECT DOC

The profile does not impose restrictions for additional keys
The DICOMDIR file shall contain Icon Images.

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Annex C: GE Healthcare Private Cardiac Exchange Profile

C.1 CLASS AND PROFILE IDENTIFICATION

Application Profile	Identifier	Description
GE Healthcare Private Cardiac Exchange CDR	PRI-GEMS-CVIS-EXCHANGE	Profile for exchange of Cardiac US and XA images

C.2 CLINICAL CONTEXT

This profile allows for exchange with the GE Healthcare CVIS (Cardio Vascular Information System) of Cardiac images, conforming to a combination of the public STD-XABC, STD-US-ID-SF and STD-US-ID-MF profiles.

C.2.1 ROLES AND SERVICE CLASS OPTIONS SECTION

The Application entity acting as a File-Set Creator generates a File Set under this Application Profile Class for purposes of exchange with a CVIS system.

The role of File Set Reader shall be used by the Application Entity of the type CVIS which receive a transferred File Set, typically for review purposes.

The role of File Set Updater is undefined.

C.3 GENERAL CLASS PROFILE

C.3.1 SOP CLASSES AND TRANSFER SYNTAXES

Information Object Definition	SOP Class UID	Transfer Syntax UID	FSC Req.	FSR Req.	FSU Req.
Basic Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Mand.	Mand.	Mand.
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Opt.	Opt.	Opt.
		Explicit VR, RLE Lossless compression, 1.2.840.10008.1.2.5			
		Explicit VR, Lossy JPEG 8-Bit Image Compression 1.2.840.10008.1.2.4.50			
US Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1			
		Explicit VR, RLE Lossless compression, 1.2.840.10008.1.2.5			
		Explicit VR, Lossy JPEG 8-Bit Image Compression 1.2.840.10008.1.2.4.50			
XA Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction 1.2.840.10008.1.2.4.70			
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian			

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DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1	Uncompressed 1.2.840.10008.1.2.1			
DX Image (Process)	1.2.840.10008.5.1.4.1.1.1.1.1				
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2				
DX Mammography Image (Process)	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Opt.	Opt.	Opt.
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3				
DX Intra-oral Image (Process)	1.2.840.10008.5.1.4.1.1.1.3.1				
CT Image	1.2.840.10008.5.1.4.1.1.2				
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3				
MR Image	1.2.840.10008.5.1.4.1.1.4				
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5				
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6				
SC Image	1.2.840.10008.5.1.4.1.1.7				
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1				
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2				
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3				
Multi-Frame True Color SC Image	1.2.840.10008.5.1.4.1.1.7.4				
Standalone Overlay	1.2.840.10008.5.1.4.1.1.8				
Standalone Curve	1.2.840.10008.5.1.4.1.1.9				
12-lead ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.1				
General ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2				
Ambulatory ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2				
Hemodynamic Waveform Cardiac Electrophysiology Waveform	1.2.840.10008.5.1.4.1.1.9.2.1 1.2.840.10008.5.1.4.1.1.9.3.1				
Basic Voice Audio Waveform	1.2.840.10008.5.1.4.1.1.9.4.1				
Standalone Modality LUT	1.2.840.10008.5.1.4.1.1.10				
Standalone VOI LUT Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11 1.2.840.10008.5.1.4.1.1.11.1				
XF Image	1.2.840.10008.5.1.4.1.1.12.2				
NM Image	1.2.840.10008.5.1.4.1.1.20				
Raw Data VL Image (Retired)	1.2.840.10008.5.1.4.1.1.66 1.2.840.10008.5.1.4.1.1.77.1				
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2				
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1				
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2				
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3				
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4				
Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11				
Enhanced Structured Reports	1.2.840.10008.5.1.4.1.1.88.22				
Comprehensive Structured Reports	1.2.840.10008.5.1.4.1.1.88.33				
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40				
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50				
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59				
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65				
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67				
Encapsulated PDF	1.2.840.10008.5.1.4.1.1.104.1				
PET Image	1.2.840.10008.5.1.4.1.1.128				
Standalone PET Curve	1.2.840.10008.5.1.4.1.1.129				
RT Image	1.2.840.10008.5.1.4.1.1.481.1				
RT Dose	1.2.840.10008.5.1.4.1.1.481.2				
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3				
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4				
RT Plan	1.2.840.10008.5.1.4.1.1.481.5				
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6				
RT Treatment Summary Record GE Collage	1.2.840.10008.5.1.4.1.1.481.7 1.2.528.1.1001.5.1.1.1				
GE AW 3D	1.2.840.113619.4.26				
GE eNTEGRA	1.2.840.113619.4.27				
GE AW Raw Data	1.2.840.113619.4.30				

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C.3.2 PHYSICAL MEDIA AND MEDIA FORMATS

The profiles from this class require the 120mm CD-R ISO/IEC 9660 Media Format, as defined in PS3.12 Annex F.

C.3.3 DIRECTORY INFORMATION IN DICOMDIR

The profile is restricted to the following types of Directory Records: PATIENT, STUDY, SERIES, and IMAGE.

The following additional keys shall be available in the DICOM file:

Information Object Definition	SOP Class UID	Directory Record Type	Keys
US Multi-frame Image US Image	1.2.840.10008.5.1.4.1.1.3.1 1.2.840.10008.5.1.4.1.1.6.1	IMAGE	(0088,0200)
XA Image	1.2.840.10008.5.1.4.1.1.12.1	PATIENT	(0010,0030) (0010,0040)
		SERIES	(0008,0080) (0008,0081) (0008,1050)
		IMAGE	(0088,0200) (0008,0008) (0050,0004) (0008,1140) (0008,1150) (0008,1155)

The DICOMDIR file shall contain Icon Images.

C.4 SPECIFIC APPLICATION PROFILES

C.4.1 PRI-GEMS-CVIS-EXCHANGE

The CVIS Exchange profile imposes the following restrictions on the IODs:

Information Object Definition	SOP Class UID	Transfer Syntax	Restrictions
US Multi-frame Image US Image	1.2.840.10008.5.1.4.1.1.3.1 1.2.840.10008.5.1.4.1.1.6.1	1.2.840.10008.1.2.1	(0028,0004) one of "MONOCHROME2", "RGB", "PALETTE COLOR", "YBR_FULL_422", "YBR_PARTIAL_422"
		1.2.840.10008.1.2.5	(0028,0004) one of "MONOCHROME2", "RGB", "PALETTE COLOR", "YBR_FULL"
		1.2.840.10008.1.2.4.50	(0028,0004) one of "YBR_FULL_422", "YBR_PARTIAL_422"
XA Image	1.2.840.10008.5.1.4.1.1.12.1	1.2.840.10008.1.2.4.70	(0008,0060) ="XA" (0028,0010) <= 512 (0028,0011) <= 512 (0028,0100) = 8 (0028,0101) = 8

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Annex D: GE Healthcare Private Cardiac Archive Profile

D.1 CLASS AND PROFILE IDENTIFICATION

Application Profile	Identifier	Description
GE Healthcare Private Cardiac Archive CDR	PRI-GEMS-CVIS-ARCHIVE	Profile for archiving of Cardiac US and XA images

D.2 CLINICAL CONTEXT

This profile enables the user to create an archive CD, to be stored in the CVIS system. It basically consists of a combination of the public STD-XA1K, STD-US-ID-SF and STD-US-ID-MF profiles.

D.2.1 ROLES AND SERVICE CLASS OPTIONS SECTION

The Application entity acting as a File-Set Creator generates a File Set under this Application Profile Class for purposes of archiving to the CVIS system.

The role of File Set Reader shall be used by the Application Entity of the type CVIS.

The role of File Set Updater is undefined.

D.3 GENERAL CLASS PROFILE

D.3.1 SOP CLASSES AND TRANSFER SYNTAXES

Information Object Definition	SOP Class UID	Transfer Syntax UID	FSC Req.	FSR Req.	FSU Req.
Basic Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Mand.	Mand.	Mand.
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Opt.	Opt.	Opt.
		Explicit VR, RLE Lossless compression, 1.2.840.10008.1.2.5			
		Explicit VR, Lossy JPEG 8-Bit Image Compression 1.2.840.10008.1.2.4.50			
US Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1			
		Explicit VR, RLE Lossless compression, 1.2.840.10008.1.2.5			
		Explicit VR, Lossy JPEG 8-Bit Image Compression 1.2.840.10008.1.2.4.50			
XA Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction 1.2.840.10008.1.2.4.70			
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian			

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DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1	Uncompressed 1.2.840.10008.1.2.1			
DX Image (Process)	1.2.840.10008.5.1.4.1.1.1.1.1				
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2				
DX Mammography Image (Process)	1.2.840.10008.5.1.4.1.1.1.2.1				
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Opt.	Opt.	Opt.
DX Intra-oral Image (Process)	1.2.840.10008.5.1.4.1.1.1.3.1				
CT Image	1.2.840.10008.5.1.4.1.1.2				
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3				
MR Image	1.2.840.10008.5.1.4.1.1.4				
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5				
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6				
SC Image	1.2.840.10008.5.1.4.1.1.7				
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1				
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2				
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3				
Multi-Frame True Color SC Image	1.2.840.10008.5.1.4.1.1.7.4				
Standalone Overlay	1.2.840.10008.5.1.4.1.1.8				
Standalone Curve	1.2.840.10008.5.1.4.1.1.9				
12-lead ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.1				
General ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2				
Ambulatory ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2				
Hemodynamic Waveform Cardiac Electrophysiology Waveform	1.2.840.10008.5.1.4.1.1.9.2.1 1.2.840.10008.5.1.4.1.1.9.3.1				
Basic Voice Audio Waveform	1.2.840.10008.5.1.4.1.1.9.4.1				
Standalone Modality LUT	1.2.840.10008.5.1.4.1.1.10				
Standalone VOI LUT Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11 1.2.840.10008.5.1.4.1.1.11.1				
XF Image	1.2.840.10008.5.1.4.1.1.12.2				
NM Image	1.2.840.10008.5.1.4.1.1.20				
Raw Data VL Image (Retired)	1.2.840.10008.5.1.4.1.1.66 1.2.840.10008.5.1.4.1.1.77.1				
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2				
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1				
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2				
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3				
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4				
Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11				
Enhanced Structured Reports	1.2.840.10008.5.1.4.1.1.88.22				
Comprehensive Structured Reports	1.2.840.10008.5.1.4.1.1.88.33				
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40				
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50				
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59				
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65				
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67				
Encapsulated PDF	1.2.840.10008.5.1.4.1.1.104.1				
PET Image	1.2.840.10008.5.1.4.1.1.128				
Standalone PET Curve	1.2.840.10008.5.1.4.1.1.129				
RT Image	1.2.840.10008.5.1.4.1.1.481.1				
RT Dose	1.2.840.10008.5.1.4.1.1.481.2				
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3				
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4				
RT Plan	1.2.840.10008.5.1.4.1.1.481.5				
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6				
RT Treatment Summary Record GE Collage	1.2.840.10008.5.1.4.1.1.481.7 1.2.528.1.1001.5.1.1.1				
GE AW 3D	1.2.840.113619.4.26				
GE eNTEGRA	1.2.840.113619.4.27				
GE AW Raw Data	1.2.840.113619.4.30				

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D.3.2 PHYSICAL MEDIA AND MEDIA FORMATS

The profiles from this class require the 120mm CD-R ISO/IEC 9660 Media Format, as defined in PS3.12 Annex F.

D.3.3 DIRECTORY INFORMATION IN DICOMDIR

The profile is restricted to the following types of Directory Records: PATIENT, STUDY, SERIES, and IMAGE.

The following additional keys shall be available in the DICOM file:

Information Object Definition	SOP Class UID	Directory Record Type	Keys
US Multi-frame Image US Image	1.2.840.10008.5.1.4.1.1.3.1 1.2.840.10008.5.1.4.1.1.6.1	IMAGE	(0088,0200)
XA Image	1.2.840.10008.5.1.4.1.1.12.1	PATIENT	(0010,0030) (0010,0040)
		SERIES	(0008,0080) (0008,0081) (0008,1050)
		IMAGE	(0088,0200) (0008,0008) (0050,0004) (0008,1140) (0008,1150) (0008,1155)

The DICOMDIR file shall contain Icon Images.

D.4 SPECIFIC APPLICATION PROFILES

D.4.1 PRI-GEMS-CVIS-ARCHIVE

The CVIS Archive profile imposes the following restriction on the IOD:

Information Object Definition	SOP Class UID	Transfer Syntax	Restrictions
US Multi-frame Image US Image	1.2.840.10008.5.1.4.1.1.3.1 1.2.840.10008.5.1.4.1.1.6.1	1.2.840.10008.1.2.1	(0028,0004) one of "MONOCHROME2", "RGB", "PALETTE COLOR", "YBR_FULL_422", "YBR_PARTIAL_422"
		1.2.840.10008.1.2.5	(0028,0004) one of "MONOCHROME2", "RGB", "PALETTE COLOR", "YBR_FULL"
		1.2.840.10008.1.2.4.50	(0028,0004) one of "YBR_FULL_422", "YBR_PARTIAL_422"
XA Image	1.2.840.10008.5.1.4.1.1.12.1	1.2.840.10008.1.2.4.70	(0008,0060) ="XA" (0028,0010) <= 1024 (0028,0011) <= 1024 (0028,0101) one of 8, 10, 12

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SC Image	1.2.840.10008.5.1.4.1.1.7	1.2.840.10008.1.2.1	(0028,0010) <= 1024 (0028,0011) <= 1024 (0028,0002)=1 (0028,0004)="MONOCHROME2" (0028,0100)=8 (0028,0101)=8 (0028,0102)=7 (0028,0103)=0

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Annex E: GE Healthcare Private PET-CT Profile

E.1 CLASS AND PROFILE IDENTIFICATION

Application Profile	Identifier	Description
GE Healthcare Private PET-CT Uncompressed CD	PRI-GEMS-PETCT	Profile for exporting of PET-CT images

E.2 CLINICAL CONTEXT

This profile enables the user to create an export CD, enabling DICOM viewers to display fusion capabilities by storage of specific DICOM tags in the DICOMDIR index file.

E.2.1 ROLES AND SERVICE CLASS OPTIONS SECTION

The Application entity acting as a File-Set Creator generates a File Set under this Application Profile Class for purposes of exporting to CDR.

The role of File Set Reader shall be used by the external application displaying the fusion capabilities. This external application is typically stored on the same CD.

The role of File Set Updater is undefined.

E.3 GENERAL CLASS PROFILE

E.3.1 SOP CLASSES AND TRANSFER SYNTAXES

Information Object Definition	SOP Class UID	Transfer Syntax UID	FSC Req.	FSR Req.	FSU Req.
Basic Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Mand.	Mand.	Mand.
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Opt.	Opt.	Opt.
DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1				
DX Image (Process)	1.2.840.10008.5.1.4.1.1.1.1.1				
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2				
DX Mammography Image (Process)	1.2.840.10008.5.1.4.1.1.1.2.1				
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3				
DX Intra-oral Image (Process)	1.2.840.10008.5.1.4.1.1.1.3.1				
CT Image	1.2.840.10008.5.1.4.1.1.2				
US Multi-frame Image (Retired) US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3 1.2.840.10008.5.1.4.1.1.3.1				
MR Image	1.2.840.10008.5.1.4.1.1.4				
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5				
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6				
US Image	1.2.840.10008.5.1.4.1.1.6.1				
SC Image	1.2.840.10008.5.1.4.1.1.7				
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1				
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2				
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3				
Multi-Frame True Color SC Image	1.2.840.10008.5.1.4.1.1.7.4				

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Standalone Overlay	1.2.840.10008.5.1.4.1.1.8	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Opt.	Opt.	Opt.
Standalone Curve	1.2.840.10008.5.1.4.1.1.9				
12-lead ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.1				
General ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2				
Ambulatory ECG Waveform	1.2.840.10008.5.1.4.1.1.9.1.2				
Hemodynamic Waveform	1.2.840.10008.5.1.4.1.1.9.2.1				
Cardiac Electrophysiology Waveform	1.2.840.10008.5.1.4.1.1.9.3.1				
Basic Voice Audio Waveform	1.2.840.10008.5.1.4.1.1.9.4.1				
Standalone Modality LUT	1.2.840.10008.5.1.4.1.1.10				
Standalone VOI LUT	1.2.840.10008.5.1.4.1.1.11				
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1				
XA Image	1.2.840.10008.5.1.4.1.1.12.1				
XF Image	1.2.840.10008.5.1.4.1.1.12.2				
NM Image	1.2.840.10008.5.1.4.1.1.20				
Raw Data	1.2.840.10008.5.1.4.1.1.66				
VL Image (Retired)	1.2.840.10008.5.1.4.1.1.77.1				
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2				
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1				
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2				
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3				
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4				
Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11				
Enhanced Structured Reports	1.2.840.10008.5.1.4.1.1.88.22				
Comprehensive Structured Reports	1.2.840.10008.5.1.4.1.1.88.33				
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40				
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50				
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59				
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65				
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67				
Encapsulated PDF	1.2.840.10008.5.1.4.1.1.104.1				
PET Image	1.2.840.10008.5.1.4.1.1.128				
Standalone PET Curve	1.2.840.10008.5.1.4.1.1.129				
RT Image	1.2.840.10008.5.1.4.1.1.481.1				
RT Dose	1.2.840.10008.5.1.4.1.1.481.2				
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3				
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4				
RT Plan	1.2.840.10008.5.1.4.1.1.481.5				
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6				
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7				
GE Collage	1.2.528.1.1001.5.1.1.1				
GE AW 3D	1.2.840.113619.4.26				
GE eNTEGRA	1.2.840.113619.4.27				
GE AW Raw Data	1.2.840.113619.4.30				

E.3.2 PHYSICAL MEDIA AND MEDIA FORMATS

The profiles from this class require the 120mm CD-R ISO/IEC 9660 Media Format, as defined in PS3.12 Annex F.

E.3.3 DIRECTORY INFORMATION IN DICOMDIR

The following additional keys shall be available in the DICOM file:

Information Object Definition	SOP Class UID	Directory Record Type	Keys

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CR Image DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1 1.2.840.10008.5.1.4.1.1.1.1	SERIES	(0054,1000) (0054,1101)
CR Image	1.2.840.10008.5.1.4.1.1.1	IMAGE	(0028,0004) (0028,0107) (0028,1050) (0028,1051) (0028,1053) (0088,0200)
DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1		
DX Image (Process) DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1.1 1.2.840.10008.5.1.4.1.1.1.2		
DX Mammography Image (Process)	1.2.840.10008.5.1.4.1.1.1.2.1		
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3		
DX Intra-oral Image (Process)	1.2.840.10008.5.1.4.1.1.1.3.1		
CT Image	1.2.840.10008.5.1.4.1.1.2		
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3		
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	IMAGE	(0028,0004) (0028,0107) (0028,1050) (0028,1051) (0028,1053) (0088,0200)
MR Image	1.2.840.10008.5.1.4.1.1.4		
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5		
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6		
US Image	1.2.840.10008.5.1.4.1.1.6.1		
SC Image	1.2.840.10008.5.1.4.1.1.7		
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1		
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2		
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3		
Multi-Frame True Color SC Image XA Image	1.2.840.10008.5.1.4.1.1.7.4 1.2.840.10008.5.1.4.1.1.12.1		
XF Image	1.2.840.10008.5.1.4.1.1.12.2		
NM Image	1.2.840.10008.5.1.4.1.1.20		
VL Image (Retired)	1.2.840.10008.5.1.4.1.1.77.1		
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2		
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1		
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2		
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3		
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4		
PET Image	1.2.840.10008.5.1.4.1.1.128		
RT Image	1.2.840.10008.5.1.4.1.1.481.1		

The DICOMDIR file shall contain Icon Images.

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